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REFUGIUM BOTANICUM.

VOL. I.



REFUGIUM BOTANICUM.

VOL. I.

LONDON :

E. NEWMAN, PRINTER, DEVONSHIRE STREET, BISHOPSGATE.

REFUGIUM BOTANICUM;
OR,
FIGURES AND DESCRIPTIONS
FROM LIVING SPECIMENS,
OF
LITTLE KNOWN OR NEW PLANTS
OF BOTANICAL INTEREST.

EDITED BY
W. WILSON SAUNDERS, F.R.S., F.L.S.

THE DESCRIPTIONS BY
H. G. REICHENBACH,
PROFESSOR OF BOTANY, AND DIRECTOR OF THE BOTANIC GARDEN AT HAMBURGH;

J. G. BAKER, F.L.S.,
ASSISTANT CURATOR OF THE KEW HERBARIUM;

AND OTHER BOTANISTS.

THE PLATES BY W. H. FITCH.

VOL. I.



LONDON:
JOHN VAN VOORST, PATERNOSTER ROW.
M.DCCC.LXIX.

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ADVERTISEMENT.

It is proposed to continue the 'Refugium' in the following manner. Part I. Vol. ii., already in the press, containing Orchids by Prof. Reichenbach, will be published as soon as possible ; and it is intended to devote the whole of Vol. ii. to plants of the natural order Orchidaceæ. Part I. Vol. iii. is in preparation, and will be shortly in the printer's hands. The Parts constituting this Volume will contain plants other than Orchids, and will appear alternately with those of Vol. ii., and at intervals of about four months.

W. WILSON SAUNDERS.

February, 1869.

P R E F A C E .

THE object of the present publication is to describe and figure, from living specimens, a series of plants in which I take much interest, and to the study and cultivation of which I have devoted many years. I allude chiefly to succulent plants generally, bulbous plants of various Families, Orchids, Aroids, Bromeliads, Geraniaceæ, &c., &c., all which I have grown for the sake of better understanding them, having felt that a thorough knowledge of their characters and peculiarities of growth could not be obtained from dried specimens, however well preserved. During the time I have been cultivating and studying the plants in question, I have felt most forcibly how inadequate words are to describe a plant properly, and that a faithful figure, with good dissections, gave a much clearer and more definite idea of the plant than words could possibly convey. A deep sense of this has induced me to commence the publication of the 'Refugium,' which I hope to make worthy of the attention of botanists, as Mr. J. G. Baker, of the Royal Herbarium, Kew, has kindly consented to undertake the descriptions from the living plants, and Mr. W. H. Fitch will give the figures and dissections. I propose devoting a considerable portion of the work to the smaller Orchids, and I have much pleasure in stating that my friend Professor H. G. Reichenbach, of Hamburg, will give me all the assistance in his power to make this part of the 'Refugium' valuable to those who study this remarkable Family of plants. I shall endeavour to publish yearly three Parts of this work, each containing 24 Plates, and forming together one volume.

W. WILSON SAUNDERS.

Hillfield, Reigate.

ERRATA.

Tab. 7 is *OTHONNA CARNOsa*, *Less.*, not *KLEINIA CRASSULEFOLIA*. The English description is correct, except that the phyllaries are not more than eight in number; but the Latin diagnosis must be rejected.

In the title to Tab. 47, for *MYRSIPHYLLUM FALCATUM*, read *FALCIFORME*.

EXPLANATION OF THE PLATES.

Tab. 1.—*OXALIS MEGALORHIZA*.

1, separate petal ; 2, centre of the flower ; 3, pistil : all magnified.

Tab. 2.—*POTENTILLA GARIEPENSIS*.

1, flower complete ; 2, side view of ditto ; 3, petal ; 4, heap of pistils ; 5, single pistil ; 6, single stamen : all magnified.

Tab. 3.—*RULINGIA PARVIFLORA*.

1, single cyme and leaf ; 2, calyx and bract ; 3, flower complete ; 4, vertical section of flower, showing the alternate barren and fertile stamens ; 5, single petal ; 6, front and back view of stamen ; 7, ovary ; 8, horizontal section of ditto : all magnified. 9, cyme with fruit, natural size ; 10, single flower, mature ; 11, hair from fruit ; 12, seeds : all magnified.

Tab. 4.—*MONSONIA BIFLORA*.

1, portion of stem, with leaf ; 2, flower from above ; 3, single petal : all magnified.

Tab. 5.—*PELARGONIUM GROSSULARIODES*.

1, side view of flower ; 2, front view of ditto : magnified.

Tab. 6.—*AIZOON SARMENTOSUM*.

1, single flower, with bracts ; 2, flower from above ; 3, pistil and two stamens ; 4, horizontal section of ovary : all magnified.

Tab. 7.—*KLEINIA CRASSULÆFOLIA*.

1, vertical section of flower, showing the receptacle and half the involucre ; 2, ligulate flower complete ; 3, top of its pistil ; 4, tubular flower ; 5, anther ; 6, top of pistil of tubular flower ; 7, single bristle of pappus : all magnified.

Tab. 8.—*GOODENIA OVATA*.

1, single flower, with petals removed : magnified.

Tab. 9.—*BRACHYSTELMA ARNOTTII*.

1, portion of stem, with a single umbel of flowers ; 2, single flower complete ; 3, centre of flower from above ; 4, ditto from the side ; 5, two views of the pollen-masses : all magnified.

Tab. 10.—*CEROPEGIA MULTIFLORA*.

1, detached leaf ; 2, flower complete ; 3, centre of flower, contained in the ball at the base ; 4, pollen-masses : all magnified.

Tab. 11.—*POLYGONUM CAPITATUM*.

1, single flower, with bract ; 2, vertical section of flower ; 3, back view of stamen ; 4, pistil : all magnified.

Tab. 12.—*PEPEROMIA PELLUCIDA*.

1, portion of spike ; 2, single flower ; 3, stamen ; 4, pistil : all magnified.

Tab. 13.—*PEPEROMIA NUMMULARIFOLIA*.

1, spike complete ; 2, leaf and portion of stem ; 3, separate leaves ; 4, separate flowers ; 5, pistil : all magnified.

Tab. 14.—*ANTHURIUM LANCEOLATUM*.

1, complete flower from above ; 2, ditto from the side ; 3, pistil and stamens ; 4, sections of ovary : all magnified.

Tab. 15.—*ZOMICARPA RIEDELIANA*.

1, spadix and flowers ; 2, stamen ; 3, pistil ; 4, horizontal and vertical section of ditto : all magnified.

Tab. 16.—*UROPETALUM WELWITSCHII*.

1, flower complete ; 2, vertical section of ditto ; 3, horizontal section of ovary : all magnified.

Tab. 17.—*UROPETALUM UMBONATUM*.

1, flower complete ; 2, vertical section of ditto ; 3, pistil ; 4, horizontal section of ovary : all magnified.

Tab. 18.—*DRIMIA COOPERI*.

1, separate flower, magnified.

Tab. 19.—*DRIMIA APERTIFLORA*.

1, separate flower, fully expanded ; 2, pistil ; 3, horizontal section of ovary : all magnified.

Tab. 20.—*ORNITHOGALUM THYRSOIDES*.

1, centre of flower, complete ; 2, a stamen of each kind, magnified.

Tab. 21.—*ASPARAGUS SCANDENS*.

1, portion of flowering-stem ; 2, stipule ; 3, flower complete ; 4, pistil ; 5, horizontal section of ovary ; 6, branch, with berries ; 7, separate berry ; 8, section of ditto ; 9, seed : all magnified.

Tab. 22.—*STENOMESSON SUSPENSUM*.

1, flower, with the divisions of the perianth removed ; 2, single stamen ; 3, pistil ; 4, stigma ; 5, horizontal section of ovary : all magnified.

Tab. 23.—*GLADIOLUS TRISTIS*.

1, flowering-stem, much reduced ; 2, upper part of ditto, natural size ; 3, leaf ; 4, portion of ditto ; 5, segment of perianth ; 6, centre of the flower : all magnified.

Tab. 24.—*HOMERIA FLEXUOSA*.

1, separate flower, with the divisions of the perianth nearly removed; 2 and 3, segments of perianth; 4, centre of flower, with divisions of perianth quite removed; 5, pistil; 6, horizontal section of ovary: all magnified.

Tab. 25.—*BILLARDIERA CYMOSA*.

1, flower with corolla taken away; 2, separate petal; 3, anther; 4, pistil; 5, horizontal section of ovary: all magnified.

Tab. 26.—*MAHERNIA CHRYSANTHA*.

1, flower with corolla and calyx taken away; 2, pistil; 3, horizontal section of ovary: all magnified.

Tab. 27.—*PELARGONIUM RUTÆFOLIUM*.

1, side view of flower; 2, front view of flower; 3, upper petal; 4, side petal; 5, lower petal; 6, flower with calyx and corolla removed: all magnified.

Tab. 28.—*PELARGONIUM SISONIFOLIUM*.

1, lower leaf after the plant has flowered, natural size; 2, flower complete; 3, upper petal: both magnified.

Tab. 29.—*PELARGONIUM FUMARIODES*.

1, side view of complete flower; 2, flower from above; 3, flower with calyx removed; 4, flower with calyx and corolla removed; 5, pistil; 6, fruit: all magnified.

Tab. 30.—*PELARGONIUM HISPIDUM*.

1, flower complete; 2, upper petal: both magnified.

Tab. 31.—*ACACIA STRIGOSA*.

1, portion of branch with cluster of flowers; 2, a separate flower: both magnified.

Tab. 32.—*SEDUM SPECTABILE*.

1, complete flower; 2, carpels of ditto: both magnified.

Tab. 33.—*SEDUM ALBO-ROSEUM*.

1, complete flower; 2, carpels of ditto: both magnified.

Tab. 34.—*SEDUM CORDIFOLIUM*.

1, complete flower; 2, carpels of ditto: both magnified.

Tab. 35.—*COTYLEDON MACULATA*.

1, pair of flowers; 2, corolla opened; 3, hypogynous scales and horizontal section of the carpels: all magnified.

Tab. 36.—*COTYLEDON RHOMBIFOLIA*.

1, cluster of flowers; 2, corolla opened; 3, hypogynous scales and horizontal section of the carpels: all magnified.

Tab. 37.—*SOLANUM ROBUSTUM*.

1, expanded flower; 2, pistil: both magnified.

Tab. 38.—*FLEURYA ÆSTUANS*.

1, raceme of female flowers; 2, male flower expanded; 3, developed female flower; 4, fruit: all magnified.

Tab. 39.—*EUPHORBIA TETRAGONA*.

1, complete flower, with pair of bract-like leaves; 2, scale from the throat of the involucre; 3, male flower; 4, its bract; 5, developed female flower: all magnified.

Tab. 40.—*PEPEROMIA MAGNOLLEFOLIA*.

1, part of a spike; 2, a single flower; 3, lateral view of the same; all magnified.

Tab. 41.—*PEPEROMIA MICROPHYLLA*.

1, spike with uppermost whorl of leaves; 2, front view of flowers; 3, side view of flower; 4, pistil: all magnified.

Tab. 42.—*TRITELEIA AUREA*.

1, pistil; 2, horizontal section of ovary; 3, stamen: all magnified.

Tab. 43.—*TRITELEIA CONSPICUA*.

1, flower opened out; 2, stamen; 3, horizontal section of ovary: all magnified.

Tab. 44.—*ALBUCA FASTIGIATA*.

1, petal from inner row; 2, stamens and pistil; 3, stamen opposite inner petal; 4, pistil; 5, horizontal section of ovary: all magnified.

Tab. 45.—*ALBUCA CAUDATA*.

1, petal from inner row; 2, stamens and pistil; 3, pistil: all magnified.

Tab. 46.—*PHÆDRANASSA CARMIOLE*.

1, vertical section of flower; 2, anther and part of filament; 3, stigma and part of style; 4, horizontal section of ovary: all magnified.

Tab. 47.—*MYRSIPHYLLUM FALCATUM*.

1, portion of branch with flowers; 2, separate flower; 3, pistil; 4, horizontal section of ovary: all magnified.

Tab. 48.—*TRADESCENTIA DISCOLOR* var. *CONCOLOR*.

1, side view of closed flower; 2, expanded flower; 3, stamen; 4, moniliform hair of filament; 5, pistil: all magnified.

Tab. 49.—*COTONEASTER MICROPHYLLA*.

1, leaf; 2, berry: both natural size.

Tab. 50.—*COTONEASTER THYMIFOLIA*.

1, leaf; 2, berry: both natural size. 3, flower, magnified.

Tab. 51.—*COTONEASTER CONGESTA*.

1, leaf; 2, berry: both natural size. 3, flower, magnified.

Tab. 52.—COTONEASTER BUXIFOLIA.

1, leaf; 2, berry: both natural size. 3, entire flower; 4, petal: both magnified.

Tab. 53.—COTONEASTER PROSTRATA.

1, leaf; 2, berry: both natural size.

Tab. 54.—COTONEASTER ROTUNDFOLIA.

1, leaf, natural size; 2, leaves with flower, magnified; 3, berry, natural size.

Tab. 55.—COTONEASTER SIMONSI.

1, tuft of leaves and berries; 2, single leaf; 3, berry: all magnified.

Tab. 56.—COTYLEDON NODULOSA.

1, leaf, natural size; 2, entire flower; 3, carpels; 4, single petal with stamen: all magnified.

Tab. 57.—COTYLEDON NUDA.

1, entire flower; 2, carpels: both magnified.

Tab. 58.—COTYLEDON LINGUEFOLIA.

1, entire flower; 2, petal with stamen; 3, carpels: all magnified.

Tab. 59.—COTYLEDON LURIDA.

1, leaf; 2, flower: both natural size. 3, petal with stamens, magnified; 4, carpels, natural size; 5, single carpel, magnified.

Tab. 60.—COTYLEDON ADUNCA.

1, flower; 2, single petal, inside view; 3, single stamen; 4, carpels: all magnified.

Tab. 61.—COTYLEDON GLAUCA.

1, leaf, natural size; 2, single flower; 3, petal, inside view, with stamens; 4, sepals and carpels; 5, single carpel: all magnified.

Tab. 62.—COTYLEDON PUMILA.

1, leaf, natural size. 2, entire flower; 3, vertical section of the same: both magnified.

Tab. 63.—COTYLEDON STOLONIFERA.

1, entire flower, magnified; 2, carpels, natural size.

Tab. 64.—COTYLEDON FULGENS.

1, entire flower; 2, carpels and inner row of stamens; 3, petal, inside view, with one of the outer row of stamens: all magnified.

Tab. 65.—COTYLEDON GIBBIFLORA var. METALLICA.

1, entire plant, much reduced; 2, flower with the corolla taken away, magnified.

Tab. 66.—COTYLEDON PULVERULENTA.

1, entire plant, about one-third the natural size. 2, leaf of rosette; 3 and 4, bract-like stem-leaves; 5, branch of panicle: all natural size. 6, entire flower; 7, portion of corolla; 8, carpels; 9, horizontal section of carpels; 10, seed: all magnified.

Tab. 67.—COTYLEDON AGAVOIDES.

1, front view of leaf; 2, side view of leaf: both natural size. 3, entire flower, magnified.

Tab. 68.—COTYLEDON CYMOSA.

1, leaf, natural size. 2, entire flower; 3, inside view of petal: both magnified.

Tab. 69.—COTYLEDON CESPITOSA.

1, leaf of rosette; 2, bract-like stem-leaf: both natural size. 3, entire flower; 4, petal with stamens; 5, carpels; 6, single carpel: all magnified.

Tab. 70.—COTYLEDON CALIFORNICA.

1, entire flower; 2, corolla; 3, vertical section of corolla: all magnified.

Tab. 71.—COTYLEDON FARINOSA.

1, entire flower, magnified.

Tab. 72.—COTYLEDON COOPERI.

1, single flower; 2, the same opened; 3, stamen: all magnified.

Natural Order ROSACEÆ.

Tribe POMEÆ.

Genus COTONEASTER, Medik.

Strips C. MICROPHYLLÆ.

Frutices humiles vel mediocres, ramis griseis vel castaneis plus minus hispidis, foliis firmis sempervirentibus parvis, perbrevisiter petiolatis, obovato-oblongis vel rotundatis, supra glabris, infra plerisque plus minus albo-sericeis, mucronatis, integris, floribus parvis solitariis vel paucis subcymosis, breviter petiolatis, calycibus campanulatis, primum plus minus albo-sericeis, dentibus lanceolato-deltaideis, stylis et nuculis geminatis, fructibus rotundatis vel turbinatis pendulis coccineis demum omnino glabrescentibus.

Under this head we propose to describe and figure all the forms of *Cotoneaster* with which we are acquainted as being under cultivation, of the group of which *C. microphylla* of Wallich is the most widely-distributed and best-known representative. Although the extremes of the series differ from one another widely, there is a very gradual transition between them by means of the intermediate gradations. We find seven plants maintaining, in the gardens, a distinct individuality; and as there is not anywhere an account of them in print, we have thought it best to figure and describe all of them together, that thus their mutual relationship may be shown, and, their characteristics being defined in a form available for reference, our readers may be encouraged to experimentise upon the permanence of the forms, by raising them from seed and observing how far they keep their characters or what changes take place.

All the seven plants which we are going to describe are low or middle-sized shrubs, with rigid dull gray or occasionally chesnut-coloured branches, more or less densely clothed with strong ascending gray hairs, which occasionally, but not usually, disappear as the branches mature. The stipules are linear, and equal or slightly exceed the petioles, which are half a line to a line long. The leaves vary in shape from oblanceolate to round, and are firm in texture, some quite naked above, but clothed below, usually permanently, with a more or less dense coating of adpressed white silky hairs. The flowers are small, under half an inch across when fully expanded, and are solitary or more usually two to four or even six together in erect short-stalked

cymes terminal on short branchlets. The calyx is campanulate, with pubescence like that of the lower side of the leaves, and five rotundato-deltoid or lanceolate teeth which reach about a third of the way down when the plant is in flower. The petals are roundish, white or pink; the styles two in number; and the scarlet naked drooping fruit contains two bony seeds, which are pressed against one another by their flat faces, but rounded on the back. As these characters are common to all the forms, we shall not repeat any of them under each.

Explanation of the Plates in 'Refugium Botanicum,' No. 1.

Tab. 1.—*OXALIS MEGALORHIZA*.

1, separate petal ; 2, centre of the flower ; 3, pistil : all magnified.

Tab. 2.—*POTENTILLA GARIEPENSIS*.

1, flower complete ; 2, side view of ditto ; 3, petal ; 4, heap of pistils ; 5, single pistil ; 6, single stamen : all magnified.

Tab. 3.—*RULINGIA PARVIFLORA*.

1, single cyme and leaf ; 2, calyx and bract ; 3, flower complete ; 4, vertical section of flower, showing the alternate barren and fertile stamens ; 5, single petal ; 6, front and back view of stamen ; 7, ovary ; 8, horizontal section of ditto, all magnified ; 9, cyme with fruit, natural size ; 10, single flower, mature ; 11, hair from fruit ; 12, seeds : all magnified.

Tab. 4.—*MONSONIA BIFLORA*.

1, portion of stem, with leaf ; 2, flower from above ; 3, single petal : all magnified.

Tab. 5.—*PELARGONIUM GROSSULARIODES*.

1, side view of flower ; 2, front view of ditto : magnified.

Tab. 6.—*AIZOON SARMENTOSUM*.

1, single flower, with bracts ; 2, flower from above ; 3, pistil and two stamens ; 4, horizontal section of ovary : all magnified.

Tab. 7.—*KLEINIA CRASSULEFOLIA*.

1, vertical section of flower, showing the receptacle and half the involucre ; 2, ligulate flower complete ; 3, top of its pistil ; 4, tubular flower ; 5, anther ; 6, top of pistil of tubular flower ; 7, single bristle of pappus : all magnified.

Tab. 8.—*GOODENIA OVATA*.

1, single flower, with petals removed : magnified.

Tab. 9.—*BRACHYTELMA ARNOTTII*.

1, portion of stem, with a single umbel of flowers ; 2, single flower complete ; 3, centre of flower from above ; 4, ditto from the side ; 5, two views of the pollen-masses : all magnified.

Tab. 10.—*CEROPEGIA MULTIFLORA*.

1, detached leaf ; 2, flower complete ; 3, centre of flower, contained in the ball at the base ; 4, pollen-masses : all magnified.

Tab. 11.—*POLYGONUM CAPITATUM*.

1, single flower, with bract ; 2, vertical section of flower ; 3, back view of stamen ; 4, pistil : all magnified.

Tab. 12.—*PEPEROMIA PELLUCIDA*.

1, portion of spike; 2, single flower; 3, stamen; 4, pistil: all magnified.

Tab. 13.—*PEPEROMIA NUMMULARIFOLIA*.

1, spike complete; 2, leaf and portion of stem; 3, separate leaves; 4, separate flowers; 5, pistil: all magnified.

Tab. 14.—*ANTHURIUM LANCEOLATUM*.

1, complete flower from above; 2, ditto from the side; 3, pistil and stamens; 4, sections of ovary: all magnified.

Tab. 15.—*ZOMICARPA RIEDELIANA*.

1, spadix and flowers; 2, stamen; 3, pistil; 4, horizontal and vertical section of ditto: all magnified.

Tab. 16.—*UROPETALUM WELWITSCHII*.

1, flower complete; 2, vertical section of ditto; 3, horizontal section of ovary: all magnified.

Tab. 17.—*UROPETALUM UMBONATUM*.

1, flower complete; 2, vertical section of ditto; 3, pistil; 4, horizontal section of ovary: all magnified.

Tab. 18.—*DRIMIA COOPERI*.

1, separate flower, magnified.

Tab. 19.—*DRIMIA APERTIFLORA*.

1, separate flower, fully expanded; 2, pistil; 3, horizontal section of ovary: all magnified.

Tab. 20.—*ORNITHOGALUM THYRSOIDES*.

1, centre of flower, complete; 2, a stamen of each kind, magnified.

Tab. 21.—*ASPARAGUS SCANDENS*.

1, portion of flowering-stem; 2, stipule; 3, flower complete; 4, pistil; 5, horizontal section of ovary; 6, branch, with berries; 7, separate berry; 8, section of ditto; 9, seed: all magnified.

Tab. 22.—*STENOMEISSON SUSPENSUM*.

1, flower, with the divisions of the perianth removed; 2, single stamen; 3, pistil; 4, stigma; 5, horizontal section of ovary: all magnified.

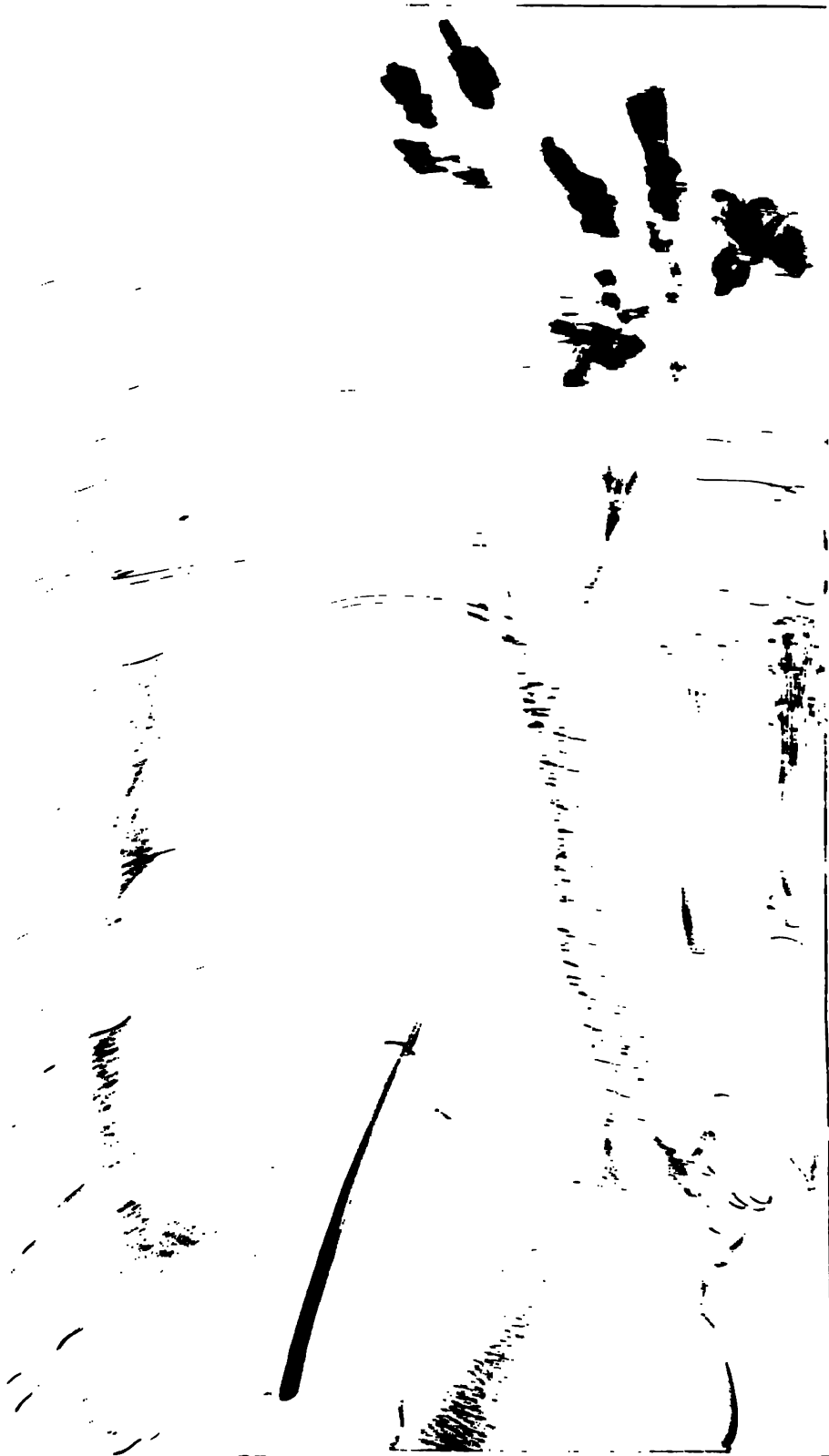
Tab. 23.—*GLADIOLUS TRISTIS*.

1, flowering-stem, much reduced; 2, upper part of ditto, natural size; 3, leaf; 4, portion of ditto; 5, segment of perianth; 6, centre of the flower: all magnified.

Tab. 24.—*HOMERIA FLEXUOSA*.

1, separate flower, with the divisions of the perianth nearly removed; 2 and 3, segments of perianth; 4, centre of flower, with divisions of perianth quite removed; 5, pistil; 6, horizontal section of ovary: all magnified.





J. N. Fitch. m.

TAB. 1.

Natural Order GERANIACEÆ.

Tribe OXALIDÆÆ.

Genus OXALIS, L.

Sect. CAPRINÆ, D.C. Acaules aut stipite nudo apice tantum folioso donatis, pedunculis uni-, bi-, vel sæpius multifloris, foliis radicalibus petiolatis plurifoliatis sæpius trifoliatis.

O. MEGALORHIZA (Jacquin *Oxalis* No. 12). Radice carnoso crasso, caule brevissimo crasso, squamato, squamis brunneis ciliatis, foliis longe petiolatis trifoliolatis, foliolis sessilibus obcordatis carnosus subglabris, pedunculo multifloro petiolis longiore, sepalis marginibus crispatis, petalis obovatis luteis glabris calyce duplo longioribus.—*D.C. Prodr.* i. p. 695; *C. Gay, Fl. Chil.* i. p. 441. *O. bicolor*, *Savi, Encyc.* iv. p. 687.

A native of Chili and Peru.

Root fleshy, at least an inch thick, divided at the crown. *Stems* short, thick, fleshy, simple, clothed with small imbricated pale brown ciliated membranous scales. *Petioles* glabrous, slender, fleshy, spreading or drooping, 4 to 6 inches long. *Leaves* ternate, the leaflets sessile, obcordate, half an inch deep by three-quarters of an inch broad, emarginate at the apex, glaucous-green above, bright purplish violet beneath, fleshy in texture but thin. *Peduncle* slender, terete, naked, 6 to 12 inches long, the main branches all springing from one point, simple or branched again, the flowers 4 to 8 in number. *Calyx* irregular, the sepals fleshy, flat and naked in the middle, the edges crisped and hairy, the base irregularly gibbous, slightly tinted like the under side of the leaves. *Bracts* small, villose, blunt, lanceolate. *Petals* twice as long as the calyx, obovate-unguiculate, bright yellow, slightly tinted with red on the outside.—*J. G. B.*

This plant I received from my friend Mr. D. Hanbury, who informs me that four serons of the stems were imported into London, in the spring of 1864, from some Port in the Pacific. It was called a sort of Rhatany-root. The name Chulloco is applied in Peru, I learn, to many species of *Oxalis*, some of which have edible tubers. The plant is of rather a lax habit, producing a quantity of yellow flowers at the top of a short fleshy stem. It grows well in a mixture of sandy loam and leaf-mould, and requires a greenhouse temperature.—*W. W. S.*

Tab. 67.—COTYLEDON AGAVOIDES.

1, front view of leaf; 2, side view of leaf: both natural size. 3, entire flower, magnified.

Tab. 68.—COTYLEDON CYMOSA.

1, leaf, natural size. 2, entire flower; 3, inside view of petal: both magnified.

Tab. 69.—COTYLEDON CÆSPITOSA.

1, leaf of rosette; 2, bract-like stem-leaf: both natural size. 3, entire flower; 4, petal with stamens; 5, carpels; 6, single carpel: all magnified.

Tab. 70.—COTYLEDON CALIFORNICA.

1, entire flower; 2, corolla; 3, vertical section of corolla: all magnified.

Tab. 71.—COTYLEDON FARINOSA.

1, entire flower, magnified.

Tab. 72.—COTYLEDON COOPERI.

1, single flower; 2, the same opened; 3, stamen: all magnified.

Natural Order ROSACEÆ.

Tribe POMEÆ.

Genus COTONEASTER, Medik.

Strips C. MICROPHYLLÆ.

Frutices humiles vel mediocres, ramis griseis vel castaneis plus minus hispidis, foliis firmis sempervirentibus parvis, perbreviter petiolatis, obovato-oblongis vel rotundatis, supra glabris, infra plerisque plus minus albo-sericeis, mucronatis, integris, floribus parvis solitariis vel paucis subcymosis, breviter petiolatis, calycibus campanulatis, primum plus minus albo-sericeis, dentibus lanceolato-deltaideis, stylis et nuculis geminatis, fructibus rotundatis vel turbinatis pendulis coccineis demum omnino glabrescentibus.

Under this head we propose to describe and figure all the forms of *Cotoneaster* with which we are acquainted as being under cultivation, of the group of which *C. microphylla* of Wallich is the most widely-distributed and best-known representative. Although the extremes of the series differ from one another widely, there is a very gradual transition between them by means of the intermediate gradations. We find seven plants maintaining, in the gardens, a distinct individuality; and as there is not anywhere an account of them in print, we have thought it best to figure and describe all of them together, that thus their mutual relationship may be shown, and, their characteristics being defined in a form available for reference, our readers may be encouraged to experimentise upon the permanence of the forms, by raising them from seed and observing how far they keep their characters or what changes take place.

All the seven plants which we are going to describe are low or middle-sized shrubs, with rigid dull gray or occasionally chesnut-coloured branches, more or less densely clothed with strong ascending gray hairs, which occasionally, but not usually, disappear as the branches mature. The stipules are linear, and equal or slightly exceed the petioles, which are half a line to a line long. The leaves vary in shape from oblanceolate to round, and are firm in texture, some quite naked above, but clothed below, usually permanently, with a more or less dense coating of adpressed white silky hairs. The flowers are small, under half an inch across when fully expanded, and are solitary or more usually two to four or even six together in erect short-stalked

Explanation of the Plates in 'Refugium Botanicum,' No. 1.

Tab. 1.—*OXALIS MEGALORHIZA*.

1, separate petal ; 2, centre of the flower ; 3, pistil : all magnified.

Tab. 2.—*POTENTILLA GARIEPENSIS*.

1, flower complete ; 2, side view of ditto ; 3, petal ; 4, heap of pistils ; 5, single pistil ; 6, single stamen : all magnified.

Tab. 3.—*RULINGIA PARVIFLORA*.

1, single cyme and leaf ; 2, calyx and bract ; 3, flower complete ; 4, vertical section of flower, showing the alternate barren and fertile stamens ; 5, single petal ; 6, front and back view of stamen ; 7, ovary ; 8, horizontal section of ditto, all magnified ; 9, cyme with fruit, natural size ; 10, single flower, mature ; 11, hair from fruit ; 12, seeds : all magnified.

Tab. 4.—*MONSONIA BIFLORA*.

1, portion of stem, with leaf ; 2, flower from above ; 3, single petal : all magnified.

Tab. 5.—*PELARGONIUM GROSSULARIODES*.

1, side view of flower ; 2, front view of ditto : magnified.

Tab. 6.—*AIZOON SARMENTOSUM*.

1, single flower, with bracts ; 2, flower from above ; 3, pistil and two stamens ; 4, horizontal section of ovary : all magnified.

Tab. 7.—*KLEINIA CRASSULEFOLIA*.

1, vertical section of flower, showing the receptacle and half the involucre ; 2, ligulate flower complete ; 3, top of its pistil ; 4, tubular flower ; 5, anther ; 6, top of pistil of tubular flower ; 7, single bristle of pappus : all magnified.

Tab. 8.—*GOODENIA OVATA*.

1, single flower, with petals removed : magnified.

Tab. 9.—*BRACHYSTELMA ARNOTTII*.

1, portion of stem, with a single umbel of flowers ; 2, single flower complete ; 3, centre of flower from above ; 4, ditto from the side ; 5, two views of the pollen-masses : all magnified.

Tab. 10.—*CEROPEGIA MULTIFLORA*.

1, detached leaf ; 2, flower complete ; 3, centre of flower, contained in the ball at the base ; 4, pollen-masses : all magnified.

Tab. 11.—*POLYGONUM CAPITATUM*.

1, single flower, with bract ; 2, vertical section of flower ; 3, back view of stamen ; 4, pistil : all magnified.

Tab. 12.—*PEPEROMIA PELLUCIDA*.

1, portion of spike; 2, single flower; 3, stamen; 4, pistil: all magnified.

Tab. 13.—*PEPEROMIA NUMMULARIFOLIA*.

1, spike complete; 2, leaf and portion of stem; 3, separate leaves; 4, separate flowers; 5, pistil: all magnified.

Tab. 14.—*ANTHURIUM LANCEOLATUM*.

1, complete flower from above; 2, ditto from the side; 3, pistil and stamens; 4, sections of ovary: all magnified.

Tab. 15.—*ZOMICARPA RIEDELIANA*.

1, spadix and flowers; 2, stamen; 3, pistil; 4, horizontal and vertical section of ditto: all magnified.

Tab. 16.—*UROPETALUM WELWITSCHII*.

1, flower complete; 2, vertical section of ditto; 3, horizontal section of ovary: all magnified.

Tab. 17.—*UROPETALUM UMBONATUM*.

1, flower complete; 2, vertical section of ditto; 3, pistil; 4, horizontal section of ovary: all magnified.

Tab. 18.—*DRIMIA COOPERI*.

1, separate flower, magnified.

Tab. 19.—*DRIMIA APERTIFLORA*.

1, separate flower, fully expanded; 2, pistil; 3, horizontal section of ovary: all magnified.

Tab. 20.—*ORNITHOGALUM THYRSOIDES*.

1, centre of flower, complete; 2, a stamen of each kind, magnified.

Tab. 21.—*ASPARAGUS SCANDENS*.

1, portion of flowering-stem; 2, stipule; 3, flower complete; 4, pistil; 5, horizontal section of ovary; 6, branch, with berries; 7, separate berry; 8, section of ditto; 9, seed: all magnified.

Tab. 22.—*STENOMESSON SUSPENSUM*.

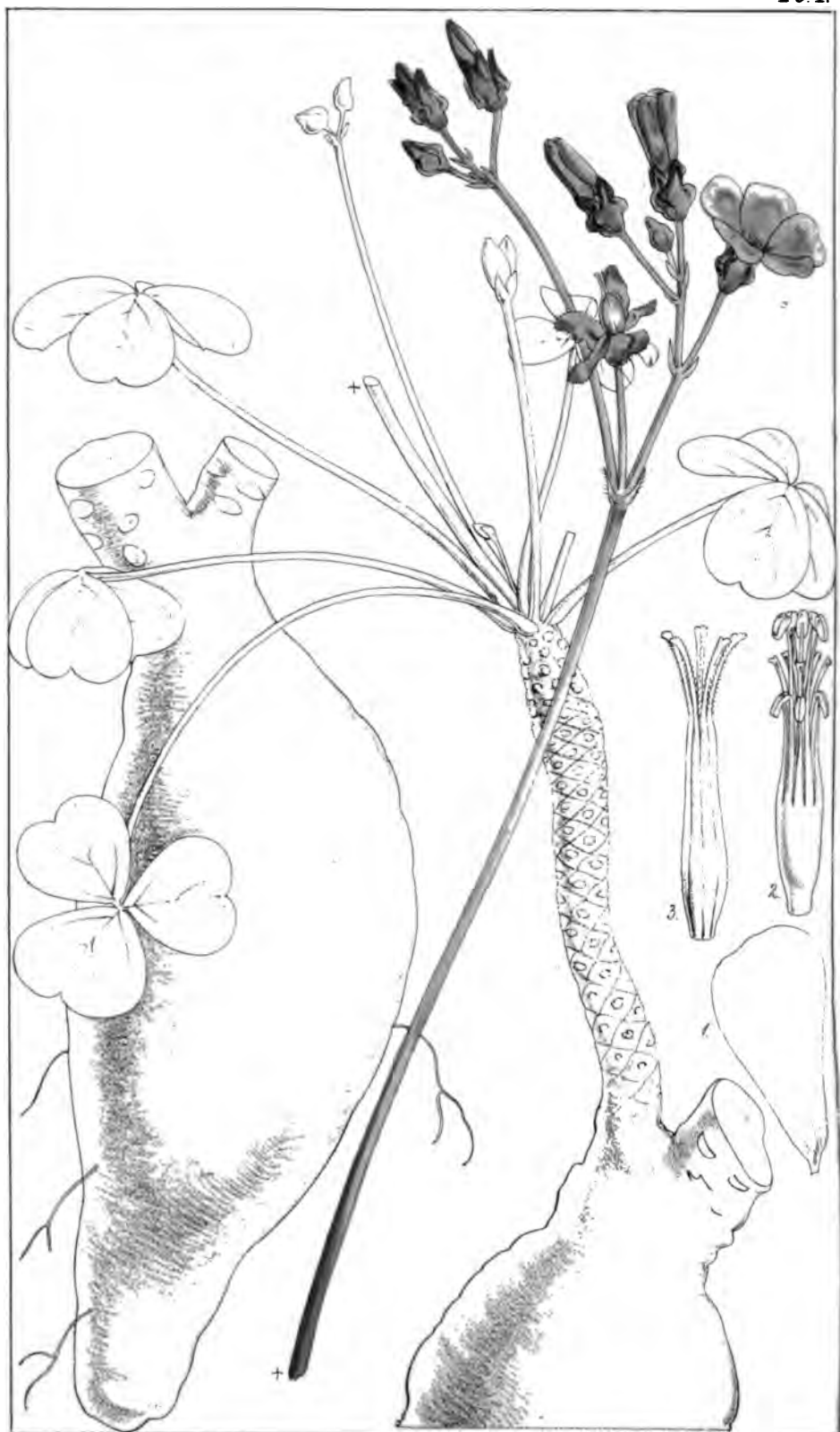
1, flower, with the divisions of the perianth removed; 2, single stamen; 3, pistil; 4, stigma; 5, horizontal section of ovary: all magnified.

Tab. 23.—*GLADIOLUS TRISTIS*.

1, flowering-stem, much reduced; 2, upper part of ditto, natural size; 3, leaf; 4, portion of ditto; 5, segment of perianth; 6, centre of the flower: all magnified.

Tab. 24.—*HOMERIA FLEXUOSA*.

1, separate flower, with the divisions of the perianth nearly removed; 2 and 3, segments of perianth; 4, centre of flower, with divisions of perianth quite removed; 5, pistil; 6, horizontal section of ovary: all magnified.



W.H.F. del et hth.

J.N. Fitch. imp.

TAB. 1.

Natural Order GERANIACEÆ.

Tribe OXALIDÆ.

Genus OXALIS, L.

Sect. CAPRINÆ, D.C. Acaules aut stipite nudo apice tantum folioso donatis, pedunculis uni-, bi-, vel sæpius multifloris, foliis radicalibus petiolatis plurifoliatis sæpius trifoliatis.

O. MEGALORHIZA (Jacquin Oxalis No. 12). Radice carnoso crasso, caule brevissimo crasso, squamato, squamis brunneis ciliatis, foliis longe petiolatis trifoliolatis, foliolis sessilibus obcordatis carnosius subglabris, pedunculo multifloro petiolis longiore, sepalis marginibus crispatis, petalis obovatis luteis glabris calyce duplo longioribus.—*D.C. Prodr.* i. p. 695; *C. Gay, Fl. Chil.* i. p. 441. *O. bicolor*, *Savi, Encyc.* iv. p. 687.

A native of Chili and Peru.

Root fleshy, at least an inch thick, divided at the crown. *Stems* short, thick, fleshy, simple, clothed with small imbricated pale brown ciliated membranous scales. *Petioles* glabrous, slender, fleshy, spreading or drooping, 4 to 6 inches long. *Leaves* ternate, the leaflets sessile, obcordate, half an inch deep by three-quarters of an inch broad, emarginate at the apex, glaucous-green above, bright purplish violet beneath, fleshy in texture but thin. *Peduncle* slender, terete, naked, 6 to 12 inches long, the main branches all springing from one point, simple or branched again, the flowers 4 to 8 in number. *Calyx* irregular, the sepals fleshy, flat and naked in the middle, the edges crisped and hairy, the base irregularly gibbous, slightly tinted like the under side of the leaves. *Bracts* small, villose, blunt, lanceolate. *Petals* twice as long as the calyx, obovate-unguiculate, bright yellow, slightly tinted with red on the outside.—*J. G. B.*

This plant I received from my friend Mr. D. Hanbury, who informs me that four serons of the stems were imported into London, in the spring of 1864, from some Port in the Pacific. It was called a sort of Rhatany-root. The name Chulco is applied in Peru, I learn, to many species of Oxalis, some of which have edible tubers. The plant is of rather a lax habit, producing a quantity of yellow flowers at the top of a short fleshy stem. It grows well in a mixture of sandy loam and leaf-mould, and requires a greenhouse temperature.—*W. W. S.*

Tab. 67.—COTYLEDON AGAVOIDES.

1, front view of leaf; 2, side view of leaf: both natural size. 3, entire flower, magnified.

Tab. 68.—COTYLEDON CYMOSA.

1, leaf, natural size. 2, entire flower; 3, inside view of petal: both magnified.

Tab. 69.—COTYLEDON CÆSPITOSA.

1, leaf of rosette; 2, bract-like stem-leaf: both natural size. 3, entire flower; 4, petal with stamens; 5, carpels; 6, single carpel: all magnified.

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Tab. 72.—COTYLEDON COOPERI.

1, single flower; 2, the same opened; 3, stamen: all magnified.

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TAB. 5.

Natural Order GERANIACEÆ.

Tribe PELARGONIÆÆ.

Genus PELARGONIUM, *L'Herit.*

Sect. PERISTERA. Caule herbaceo, gracili, diffuso, foliis lobatis vel pinatifidis, floribus parvis, petalis sepalis brevioribus aut æqualibus.

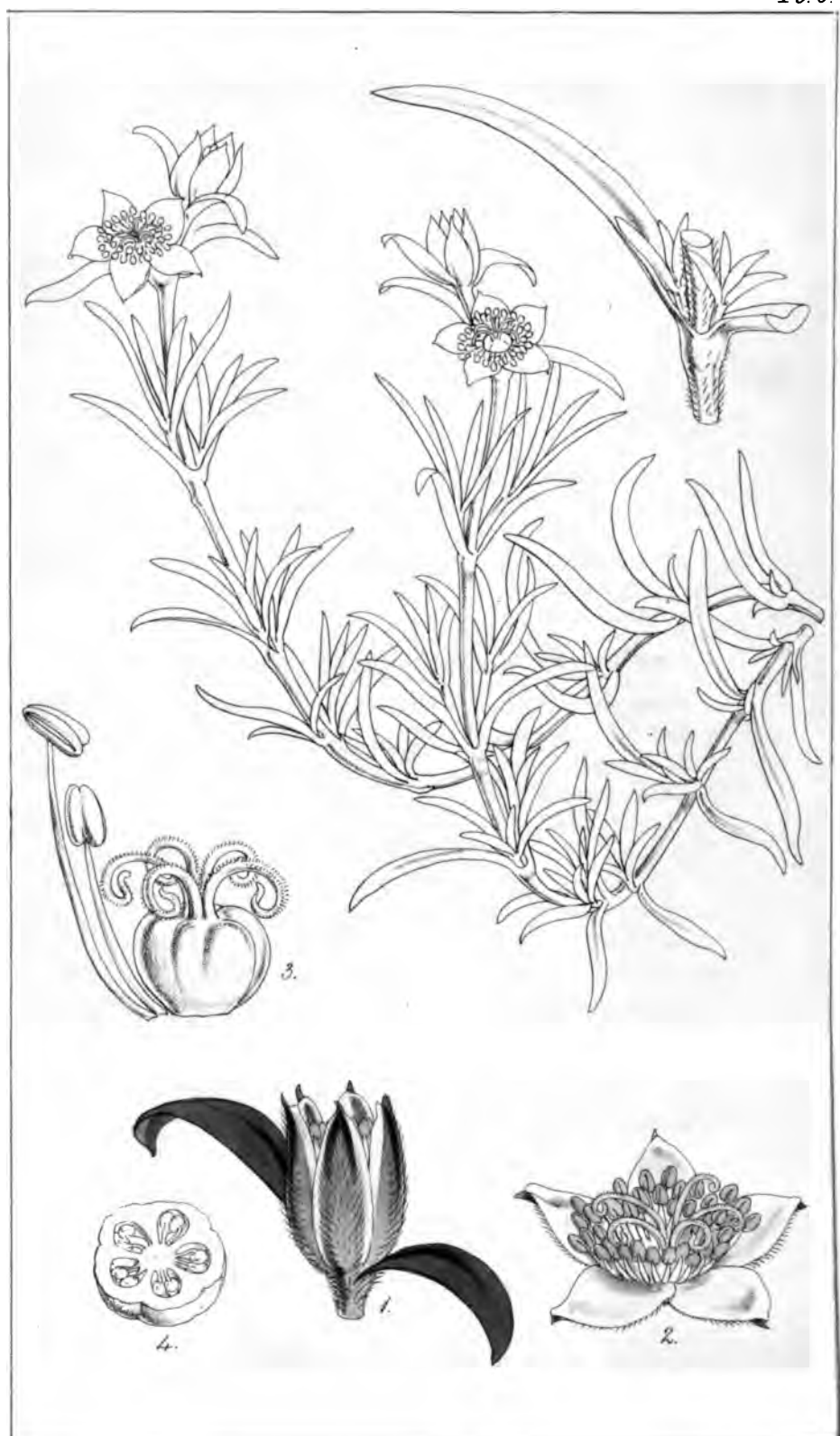
P. GROSSULARIOIDES (*Ait. Hort. Kew*, vol. ii. p. 42). Caule subglabro, petiolis inferioribus foliis duplo longioribus, foliis subglabris rotundato-cordatis parce palmatisectis lobis inciso-serratis, pedunculis longis filiformibus, umbellis 3—8 floris, sepalis lanceolatis nervatis, petalis purpureis cuneatis sepalis subæquantibus.—*Cav. Diss.* i. 119, fig. 2; *D.C. Prodr.* i. p. 660; *Harv. and Sond. Fl. Cap.* i. p. 289, *Geranium anceps*, *Jacq. Coll.* iv. t. 22, fig. 3. *P. nummularifolia*, *Ecklon and Zeyher*.

A native of the Cape of Good Hope.

Under the name of *P. grossularioides* Dr. Harvey brings together, in the 'Cape Flora,' a large number of allied forms. As we shall probably have occasion to refer afterwards to some of these, we now figure and describe what may be regarded as the typical plant as a standard for comparison.

Stems copiously branched, diffuse, herbaceous, nearly glabrous, angular, furrowed. *Stipules* small, ovate, membranous. *Lower petioles* two to three inches long. *Leaves* roundish in general outline, an inch and a half to two inches each way, the base deeply cordate, the edge palmately lobed about a third of the way down, the divisions irregularly inciso-dentate, texture herbaceous, veining flabellate, surfaces thinly hairy. *Flowers* in copious 3- to 8-flowered umbels on long slender peduncles. *Bracts* minute, lanceolate, membranous. *Pedicels* a quarter of an inch long. The *calyx* about the same. *Sepals* lanceolate, nerved. The *petals* bright purple, equalling the sepals in length, and nearly equal to one another in breadth, cuneato-ligulate, about a line broad. *Fertile stamens* five. The *stigmas* the same colour as the petals.—*J. G. B.*

This plant was raised from seeds sent from South Africa by Mr. Thos. Cooper. It grows freely in a light rich soil, and thrives well in the open air during the summer time, where it spreads on the ground and produces a pleasing effect. The plant requires a warm pit or cool greenhouse during the winter.—*W. W. S.*



TAB. 6.

Natural Order FICOIDEÆ.

Tribe TETRAGONIÆÆ.

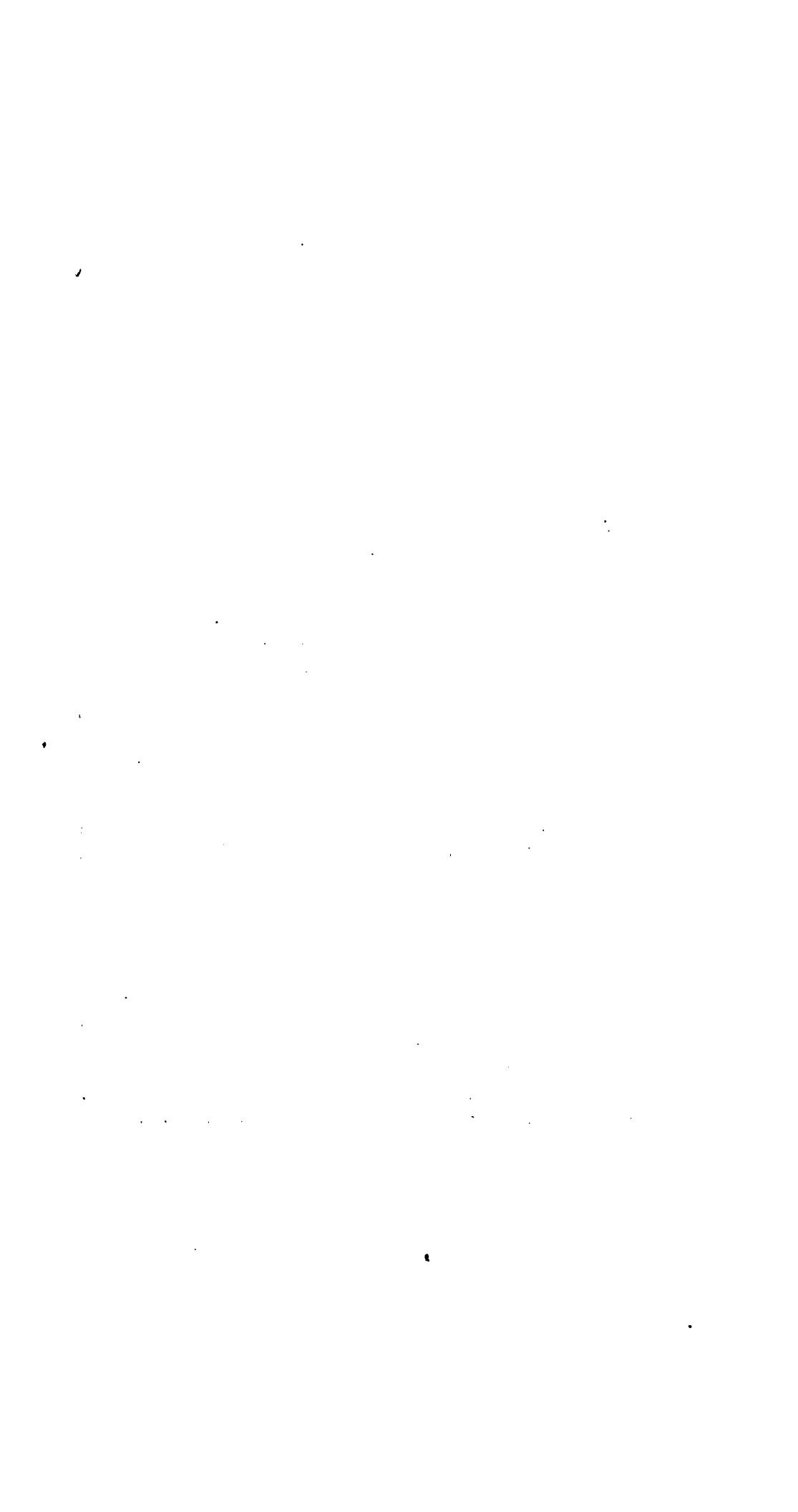
Genus AIZOON, L.

A. SARMENTOSUM (Linn. *fil. Suppl.* 260). Caule herbaceo, diffuso, sarmentoso, glabro, foliis oppositis semicylindricis glabris, floribus terminalibus solitariis vel paucis, sepalis ovato-lanceolatis extus viridibus villosis intus albidis, bracteis lanceolatis brevioribus.—*Thunb. Fl. Cap.* p. 416; *Burm. Afr.* t. 26, fig. 2; *D.C. Prodr.* vol. iii. p. 454; *Harv. and Sond. Fl. Cap.* ii. p. 471.

A native of the cape of Good Hope; not uncommon.

Stems many from the same root, half a foot to a foot long, firm, naked, often rooting. *Leaves* opposite, the lower ones often with tufts of small leaves in their axils, sessile, an inch long, fleshy but firm, a line broad, naked, bright green, slightly channelled on the face, semicircular on the back, the lower nodes about half an inch apart. *Flowers* terminal, solitary, or more usually in pairs or several, and, if so, subpaniculate, the central one sessile and the lateral ones stalked. *Fully-expanded flowers* five-eighths to three-fourths of an inch broad, with two green lanceolate bracts close to them on the outside and exceeding them, the divisions of the single floral envelope ovate-lanceolate, white within, three or four lines deep, green and adpressed-hairy on the outside, but becoming white towards the edges. *Stamens* more than twenty, about half as long as the *calyx*. *Capsule* depresso-globose, obscurely pentagonal.—*J. G. B.*

Seeds of this plant were sent to me from the Cape of Good Hope by Mr. Thos. Cooper. It grows well in any light garden soil, and requires a cool greenhouse treatment.—*W. W. S.*





TAB. 7.

Natural Order COMPOSITÆ.

Sub-order TUBULIFLOREÆ.

Tribe SENECEONEÆ.

Genus KLEINIA, L.

K. CRASSULÆFOLIA (*D.C. Prodr.* vi. p. 336). Caule suffruticoso glabro carnosio, foliis paulo supra collum confertis, semiteretibus acutiusculis integerrimis, ramo florido annuo erecto nudo apice bifido aut subdichotomo, pedicellis elongatis squamellosis unicephalis, capitulis hemisphæricis discoideis homogamis, involucro circa 12-phyllo disco vix brevior, acheniis adpresse puberis. — *Harv. and Sond. Fl. Cap.* iii. p. 817.

A native of the Cape of Good Hope.

Root fruticose, perennial, the *stems* dying down to it in the winter, the portion that bears the leaves three or four inches high, four or five lines thick, fleshy, naked. *Leaves* subcylindrical, narrowed to a point, two to three inches long, nearly a quarter of an inch thick, fleshy, naked, crowded, sessile, quite entire. *Peduncle* six to eight inches high, quite naked. *Heads* three to six, subcorymbose, solitary, on arcuate slender *pedicels*, two to three inches long, with a small lanceolate *bract* at the base, and two or three others. *Phyllaries* about 12, fleshy, naked, linear-oblong, green and thickened in the middle, membranous towards the edge. *Heads* an inch across, the *flowers* bright yellow, the outer row ligulate, female, the middle ones about 30, tubular, perfect. *Receptacle* convex. *Achenes* pubescent. *Pappus* white.

The genus *Kleinia* differs from *Senecio* only in having a tip to the branches of the style in the discoid flowers. In *Senecio* these are truncate.—*J. G. B.*

I am indebted to the Royal Gardens at Kew for this interesting plant. It produces its blossoms rather freely when grown in a light and airy greenhouse. It requires but little moisture during the winter season, and should be potted in sandy peat and loam. — *W. W. S.*



W. H. F. del et lith.

J. N. Fitch imp.

TAB. 8.

Natural Order GOODENIACEÆ.

Genus GOODENIA, *Smith.*

Sect. OCHROSANTHUS, *G. Don.*—Capsula bilocularis vel septo abbreviato subunilocularis. Corolla bilabiata flava, lobis alatis stigmatis labia corollæ parallela.

G. OVATA (*Smith. Linn. Trans.* vol. ii. p. 34). Caule suffruticoso erecto glabro, petiolis brevibus, foliis ovatis serratis, cymis axillaribus trifloris pedunculis petiolis longioribus, corollæ segmentis obovatis subæqualibus, seminibus uniserialibus.—*Brown, Prodr. Fl. Austr.* p. 575; *D.C. Prodr.* vii. p. 514.

A native of Australia.

An undershrub, with long almost woody terete naked branches. *Leaves* alternate. The *petioles* a quarter to half an inch long, the blade ovate, two to three inches long by about half as broad, the point acute, the base cordate, the edges regularly, sharply, but not deeply toothed. *Flowers* in three-flowered cymes from the axils of the leaves. The main *peduncle* slightly exceeding the petiole. The *pedicels* equal, about half an inch long, with a pair of linear *bracts* where they fork, and each with a similar pair about the middle. *Calyx* green, naked, herbaceous, seven to eight lines deep, the slender tube about equalling the five linear-subulate teeth. *Corolla* bilabiate, the tube about equalling the calyx, the divisions obovate, three-eighths of an inch deep, subequal, yellow, veined towards the throat with red. *Stamens* considerably shorter than the calyx-teeth, equalling the *stigma*, the cup or involucre of which is bearded round the edge at the base. *Seeds* in a single row.—*J. G. B.*

This plant was raised from seeds kindly presented to me by S. Solly, Esq., F.R.S., who obtained them from Australia. Its golden yellow flowers are produced freely, during the winter months, on upright or spreading branches, forming a small bush some two to three feet high. It is well worth cultivating as an ornamental plant, and grows freely in a mixture of sandy loam and peat. The temperature should be that of a cool greenhouse.—*W. W. S.*



TAB. 9.

Natural Order ASCLEPIADACEÆ.

Tribe STAPELIEÆ.

Genus BRACHYSTELMA, R. Br.

B. ? *ARNOTTII*, n. sp. Radice napiformi, caule erecto ramoso puberulo, foliis subsessilibus ovato-spathulatis crispis, corollâ rotata segmentis lanceolatis reflexis, coronâ subbiseriata, dentibus exterioribus erectis emarginatis, interioribus truncatis staminibus oppositis, stigmate peltato.

Root napiform, between fleshy and corky, two to three inches thick, projecting a little above the soil, the top nearly flat, the outer coat membranous, naked, pale brown. *Stem* four to six inches high, erect, slightly branched, slender, herbaceous, finely gray-pubescent. *Leaves* nearly sessile, in opposite pairs, ovate-spathulate, erecto-patent, crisped, one-fourth to three-eighths of an inch long, folded together, dull green above, densely gray-pubescent beneath. *Flowers* one to three from the axils of the leaves. *Pedicels* at first very short and ascending, becoming three to four lines long and considerably deflexed by the time the flowers expand, finely gray-pubescent. *Calyx* not more than half a line deep, cleft nearly to the base, finely gray-pubescent, the teeth linear. *Corolla* five-cleft three-quarters of the way down, the divisions velvety, bright brown, lanceolate, reflexed, an eighth of an inch deep, the tip green. *Staminal corona* subbiseriate, the outer row consisting of five erect greenish horns, which are alternate with the *stamens*, dilated and emarginate at the apex, the inner row of short truncate greenish processes inflexed against the back of the dilated yellow connectives. *Stigma* peltate.

A very curious little plant, sent by Dr. Arnott from the Province of Colesberg, in South Africa, to the Royal Gardens at Kew, which we are indebted to Dr. Hooker for the opportunity of figuring. From *Brachystelma*, as defined in De Candolle's 'Prodromus,' it differs by its almost rotate corolla, and by the character of the corona, which in *Brachystelma* consists of five teeth opposite the stamens. Our plant has the teeth alternate, with the stamens and short intermediate processes inflexed against them, so that it is intermediate between *Brachystelma* and Harvey's *Decaceras*, which has ten equal teeth.—J. G. B.



TAB. 10.

Natural Order ASCLEPIADACEÆ.

Tribe STAPELEEÆ.

Genus CEROPEGIA, Linn.

C. MULTIFLORA, *n. sp.* Radice napiformi, caule volubile glabro, foliis linearibus subteretis sulcatis, floribus 4—6 pedicellatis in foliorum axillis sine pedunculo communi, corollâ basi ventricosa, limbi laciniis lanceolatis piloso-ciliatis, coronæ staminoideæ dentibus exterioribus connatis, interioribus lingulatis. — *Systrepha multiflora*, Burchell, MSS.

Root napiform, between fleshy and corky, three or four inches thick, projecting a little above the soil, the top nearly flat, the outer coat membranous, pale brown, naked. *Stem* firm, wide-twining, slender, string-like, naked. *Leaves* opposite, reflexed, about an inch long, nearly as thick as broad, channelled on the face, naked. *Flowers* in clusters of four to six from the axils, without any common peduncle, the *pedicels* finally three-eighths to one-half of an inch long, swollen at the apex. *Calyx* naked, a line deep, cut half-way down, the teeth linear. *Corolla* half to three-quarters of an inch long, greenish purple, swollen into a globe at the base, above this a narrow tube half an inch long, the divisions lanceolate, erecto-patent, an eighth of an inch deep, densely gray-pilose on the inner side, the tips connected by a web of slender threads which meet in the centre. *Corona* in the ball, pure white, plaited, the outer row truncate, the inner consisting of five connivent linear pure white teeth. *Pollen-masses* yellow, ovoid, spreading.

From the Province of Colesberg, sent, like the preceding, by Dr. Arnott, and also grown at Kew. There are dried specimens in Dr. Burchell's collections, and he has given the plant a name in manuscript. In characters and habit it comes nearest to *C. linearis*, E. Meyer.—*J. G. B.*

TAB. 11.

Natural Order POLYGONACEÆ.

Genus POLYGONUM, Linn.

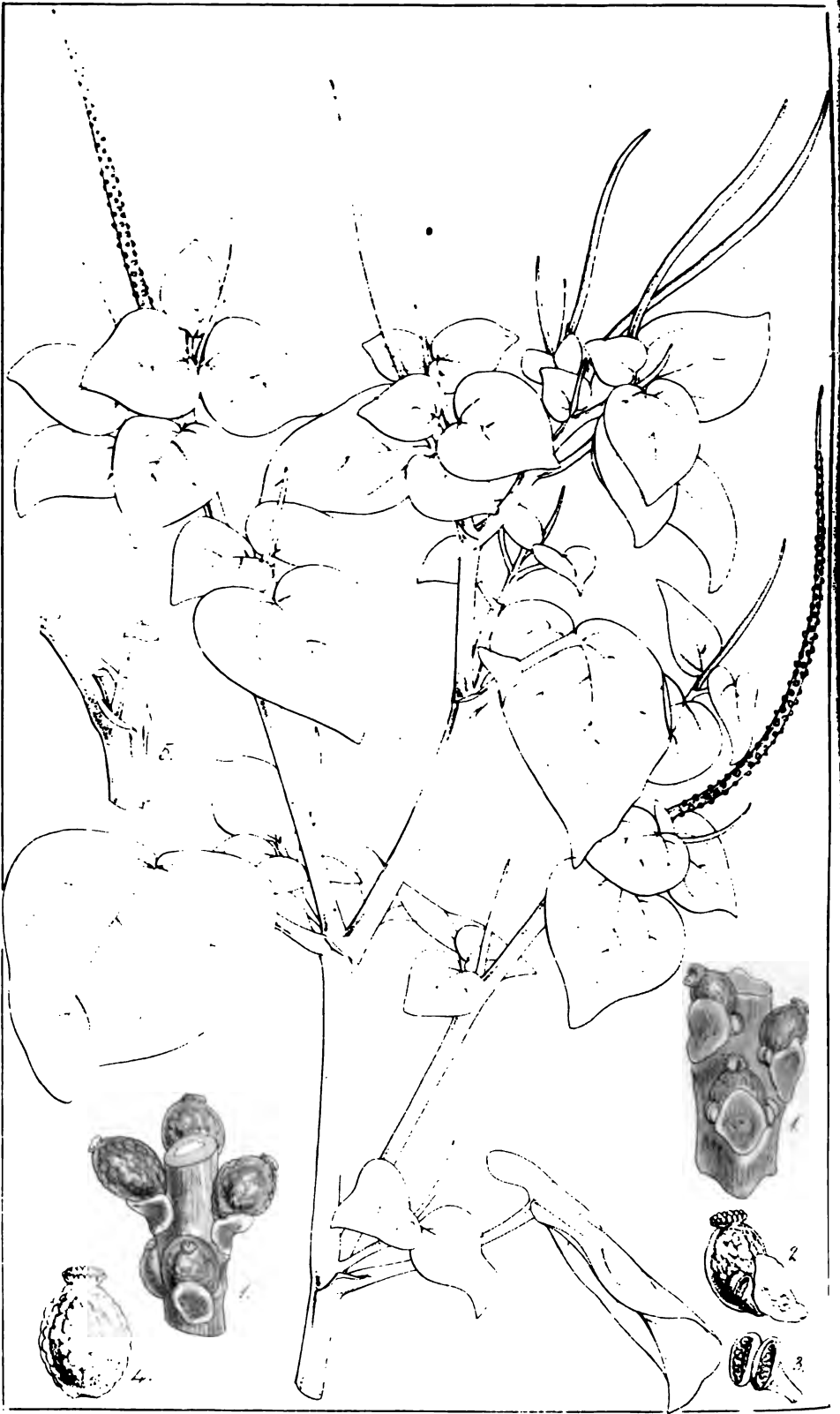
Sect. CEPHALOPILON, Meisn. Flores capitati. Calyx semicorollinus, 4—5 partitus. Stamina 8 vel rarius 6. Glandulæ vel squamæ perigynæ nullæ. Styli 3 vel raro 2, filiformi, semicounati, stigmatibus capitatis. Achænium calyce parum aucto sicco vel rarius subcarnoso totum inclusum, trigonum.

P. CAPITATUM (Hamilt. in Don. Prodr. Fl. Nep. p. 73). Caule radicante ramoso cum ochreis foliisque pube purpurascente hispidulo, foliis ovatis vel ellipticis subacutis, petiolo brevissimo utrinque foliaceo-auriculato, capitulis geminatis vel solitariis majusculis densifloris, bracteis paleaceis ovatis acutis nudis, floribus quinquefidis octandris hemitrigynis, achenio obtuse trigono obsolete granulato.—Meisn. Monogr. p. 82; D.C. Prodr. xiv. p. 129; Bab. in Linn. Trans. vol. xviii. p. 107. *P. repens*, Wall. Cat. 1699; Meisn. in Wall. Pl. As. Rar. iii. p. 60.

Not uncommon in the North of India.

A perennial, with firm slender diffusely spreading stems, moderately densely clothed with short deflexed gray hairs. *Ochreae* herbaceous, short, the lower part clasping the stem firmly, the upper part reflexed. *Nodes* about half an inch apart. *Petioles* very short, with a foliaceous wing. *Leaves* ovate or elliptical, the largest two inches long by about an inch broad, the point subacute, the base rounded with a haft, texture herbaceous, not at all rigid, upper surface full green, lower rather paler, both sides moderately thickly clothed with short spreading gray hairs like those of the stem, an oblique dark blotch running down from the middle of the leaf to the base on both sides of the midrib. *Flowers* in dense rounded heads, about half an inch broad, on *peduncles* a quarter to an inch long, the separate flowers sessile, with a small ovate membranous bracteole clasped round them, the perianth pink, the tube rather longer than the five blunt ovate divisions. *Stamens* five to eight, inserted in the throat of the tube. *Style* tripartite about half-way down. *Nut* obtusely trigonous, faintly granulated.—J. G. B.

The seeds of this plant I obtained, some years since, from Nepal, through the late Dr. Royle. It is easy of cultivation and nearly hardy, and well suited, from its trailing habit, for hanging-baskets, where its pretty pink flowers and dark spotted leaves produce an elegant effect. It does well in a cool conservatory.—W. W. S.



W H F del et lith.

J N Fitch. imp

TAB. 12.

Natural Order PIPERACEÆ.

Genus PEPEROMIA, R. & P.

Sect. MICROPIPER, Miquel. Bacca sessilis. Caulescentes ramosæ. Flores sæpe remotiusculi. Ovarium ovatum, oblongum, apice stigmatiferum.

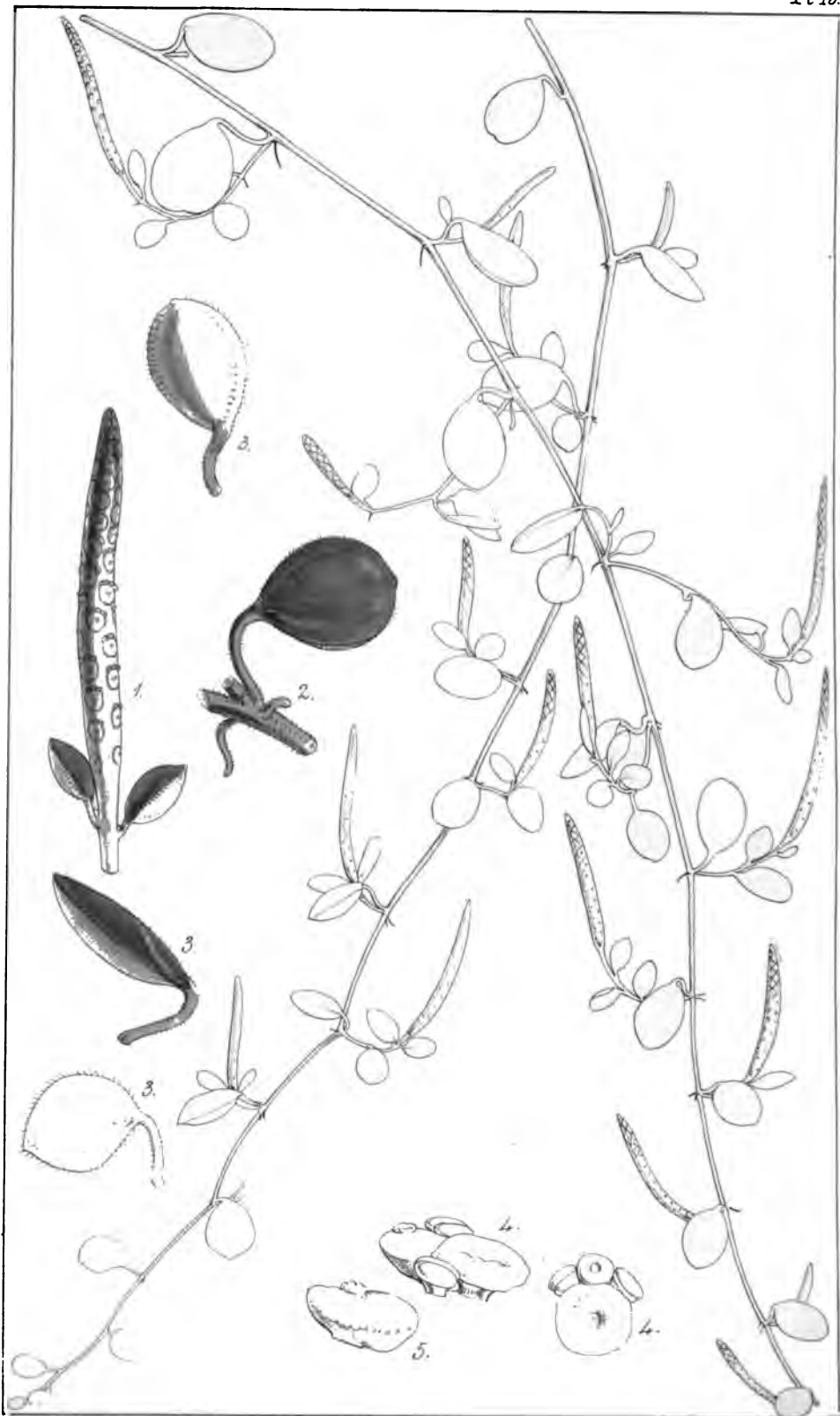
P. PELLUCIDA (H. B. K. *Nov. Gen. Tom. i.* p. 64). Succulento-pellucida glabra, ramis lævibus dichotomis, foliis deltoideo-cordatis, obtusiuscule acuminatis, glabris, quinquenervis, amentis breviter pedunculatis axillaribus terminalibusve filiformibus erectis, folio bis terve superantibus, bracteis oblongis excentrice peltatis, ovario oblongo-cylindrico, apice stigmatifero.—*Pl. Æquin. Tom. ii.* p. 53; *Kunth, Synop. i.* p. 117; *Miquel, Systema*, p. 79; *Griseb. Flora*, p. 165. *Piper pellucidum*, *Linn. Syst. Veg. Hort. Cliff. tab. 4*; *Plumier*, t. 72.

Extends from the West Indies southward to Brazil and Peru.

Stem erect, about two feet high, copiously branched, weak, fleshy, about a quarter of an inch thick at the base, like the rest of the plant naked, and in colour a very pale pellucid green. *Internodes* one to two inches long. *Leaves* alternate, the lower ones stalked, the upper nearly sessile, cordate-ovate, the larger ones an inch and a half long by more than half as broad, often decurved, the texture thin but fleshy, the under surface very pale and shining, the veins prominent. *Spikes* short-stalked, copious, one to two inches long, under a line thick, narrowed gradually upwards. *Flowers* with a considerable space between them, the *bract* oblong, obtuse, green, attached a little above its base. *Ovary* oblong, with a single two-celled *anther* on each side, crowned with the *stigma*. *Berry* oblong, longitudinally striated when dry.—*J. G. B.*

This delicate and fragile species of *Peperomia*, well named from its almost transparent stems, was obtained from chance seeds, which germinated in earth which was sent, with other plants, from Trinidad. It grows rapidly in turfy peat with plenty of drainage, and requires a damp stove-heat and not too much light. It seeds very freely.—*W. W. S.*





W.H.F. del et lith.

J.N. Fitch, imp.

TAB. 13.

Natural Order PIPERACEÆ.

Genus PEPEROMIA, *R* & *P*.

Sect. ACROCARPIDIUM, *Miquel*. Bacca parte inferiore contracta pseudopedicellata. Herbæ Americanæ sæpe teneræ, ramosæ, repentes, radicales.

P. NUMMULARIFOLIA (*H. B. K. Nov. Gen. Tom. i. p. 66*). Caule filiforme, ramisque pilosulis, foliis alternis orbiculatis vel ovati-rotundatis convexo-concavis trinerviis carnosius punctatis pubescentibus et ciliatis, pedunculis puberulis, baccis oblongis.—*Pl. Æquin. Tom. ii. p. 54*; *Kunth. Synop. i. p. 118*; *Griseb. Fl. Brit. West. Ind. p. 164*. *Piper nummularifolium*, *Swartz. Fl. Ind. Occ. i. p. 72*. *Acrocarpidium nummularifolium*, *Miquel in Diar. Instit. Nederl. 1843*; *Syst. Pip. p. 52*.

A native of Tropical America, from the West Indies and Mexico southward to Brazil.

Stems wide-trailing and rooting, slender, green, fleshy, fragile, naked. *Nodes* an inch or more distant on the well-grown shoots. The *leaves* on short *petioles*, alternate, spreading or deflexed, roundish or broad-obovate, one-half to five-eighths of an inch long by usually rather less broad, the apex hardly at all pointed, the base rounded, texture fleshy, both sides bright green, both the edge and surfaces finely and inconspicuously hairy, the veins thin and not anastomosing. *Spikes* terminal, on short leafy stalks from the axils of the leaves of the main stem, half to one inch long, under a line thick. *Flowers* with a considerable space between them. The *bracts* green, roundish. The *ovary* central, with a two-celled *anther* on each side of it. *Berry* oblong.—*J. G. B.*

As *Peperomia pellucida*, the present plant was obtained from Trinidad, and under similar circumstances. It is an interesting and elegant trailing plant, growing well and rapidly on mossy blocks of wood suspended in the shade. It is very impatient of cold, and requires a damp stove.—*W. W. S.*



W.H.F. del. et lith.

J.N. Fitch. ~~sculp.~~

TAB. 14.

Natural Order AROIDEÆ.

Genus ANTHURIUM, *Schott.*

Sect. ACAMPTOPHYLLUM. Caudex abbreviatus, contractus. Lamina coriacea, stricta, oblonga vel lanceolata basi acuta vel obtusa. Costa crassa, venis tenuibus, pseudoneuro continuo, impunctata. Pedunculi longi, stricti. Spadix longus, multiflorus. Ovarii loculamenta uniovulata. Bacca colorata.

A. LANCEOLATUM (*Kunth. Enum.* iii. p. 71). Petiolis brevibus teretibus apice incrassato, foliis lanceolatis basin versus angustatis, apice acutatis pseudoneuris marginibus approximatis, pedunculo foliis excedente, spathâ lanceolata deflexa, spadice sessili cylindrico.—*Schott, Prodr.* p. 479; *Griseb. Fl. Brit. W. Ind.* p. 508. *Pothos lanceolata*, *Linn. Sp.* p. 1878. *A. Willdenowii*, *Kth. and Schott. loc. cit.*

A native of the West Indies, figured long ago by Plumier.

Rootstock erect, two to three inches high, the *leaves* whorled round it, sending out copious adventitious rootlets from the sides. *Petioles* one to three inches long, flat on the face, rounded on the back, swollen at the base of the leaf, firm, naked, erect. *Leaves* lanceolate, about a foot long, two inches broad, narrowed from the middle downwards, slightly rounded at the base, texture firm, the midrib keel-like, colour dark green, both sides naked, the veins immersed, the main ones parallel, united within a short distance of the edge. *Peduncle* firm, erect, terete, slightly exceeding the leaves, purplish brown towards the base. *Spathe* lanceolate, deflexed, green, slightly enrolled, about three inches long by half an inch broad. *Spadix* sessile, cylindrical, marone-coloured, four to five inches long, one-fourth to three-eighths of an inch thick. *Ovary* oblong, two-seeded.—*J. G. B.*

I am indebted to the Royal Botanical Garden at Kew for this plant, which thrives well in the shade of a damp stove. It should be grown in decayed Sphagnum or in turfy peat, where the succulent roots can be well supplied with moisture.—*W. W. S.*



W.H.F. del. et lith.

J.N. Fitchamp.

TAB. 15.

Natural Order AROIDEÆ.
Genus ZOMICARPEÆ, Schott.

Genus ZOMICARPA, Schott. Spathæ persistentis tubus ad basin brevissime cucullatus, ceterum convolutus. Spadicis feminea pars spatha dorso adnata, mascula appendiculata, libera. Antheræ rimula ovali, vertice aperientes, locellis subpersistentibus.

Z. RIEDELIANA, Schott, *Prodr. Aroid.* p. 122. Foliis tri-quinquepartitis segmentis ovatis, spadice spatham duplo longiore, spathæ dimidio sterili clavato, organis neutris subulato-mucronatis paucis.

A native of Brazil.

Scape about a foot high, naked, terete, olive-green. *Petioles* four to six inches long, like the scape but more slender. *Leaves* ternate, the central division ovate, entire, about three inches long by half as broad, the lateral divisions larger, varying from unequal-sided, with a large deltoid auricle at the base on the lower side, to cut down nearly to the base into two subequal ovate or ovate-lanceolate divisions, texture fleshy, colour dark green above, lower surface paler, the whole uniform, or, in the variety figured, variegated with white in the middle. *Spadix* three to four inches long, green, fleshy, the lower part rolled round the spathe, the upper flattened out, the apex deflexed. *Spathe* about half as long as the spadix, the part which bears the ovules attached on one side with, in our specimen, three broadly flask-shaped green fleshy *ovules*; on the other, above this one, with a large number of small crowded roundish *anthers*, all round the upper half barren, green, cylindrical, with a few spiny processes at the base. *Berries* round, the *seeds* oblong-clavate, in a circle from the base.—J. G. B.

I received the tubers of this curious little *Arad* from Mr. Reed, who obtained them near Bahia. It grows freely in a moist stove. The soil should be a mixture of sandy loam and leaf-mould, kept well watered when the plant is growing. When the leaves begin to fade the plant wants a season of warm moderately dry rest.—W. W. S.



TAB. 16.

Natural Order LILIACEÆ.

Tribe SCILLEÆ.

Genus UROPETALUM, Ker.

U. WELWITSCHII, n. sp. Bulbo rotundato, foliis linearibus duobus planiusculis scapo subæquantibus, pedicellis secundis nutantibus vel patulis floribus delapsis bracteis superantibus, perianthiis cylindricis viridibus, segmentis interioribus connatis exterioribus longioribus recurvatis, capsulâ æqualiter oblongâ.

A native of Angola, received from Dr. Welwitsch. It comes nearest to the Mozambique *U. longifolium*, Lindl. Bot. Reg. t. 974.

Bulbs nearly spherical, waxy white. *Scape* about a foot high, erect, slender, terete, glaucous-green, naked. *Leaves* linear, about two lines broad, equalling or slightly exceeding the scape, sheathing it at the base, flat upwards, recurved, fleshy in texture, minutely ribbed, glaucous-green, naked. *Raceme* secund, four- to six-flowered, three to four inches long. *Bracts* small, membranous, lanceolate-acuminate, equalling the flowering but shorter than the fruiting *pedicels*, which are finally two lines long. *Flowers* at first cernuous, finally erecto-patent, green throughout, the inner segments of the *perianth* five-eighths of an inch long, connate at the edges, shortly patulous at the tips, the outer segments three-fourths to seven-eighths of an inch long, reaching down within a quarter of an inch of the base, the outer third reflexed, the tip cylindrical. *Stamens* six, equal, one to each segment from the throat of the united tube. *Ovary* equally ovate, bluntly triquetrous, hardly at all sulcate.—J. G. B.

This new species of *Uropetalum* was kindly presented to me by my friend Dr. Wellwitsch, who has done so much for the Botany of a very little known region of South Africa. It thrives well treated in the same way as an *Ixia*, in sandy loam and peat, and grown exposed to the light in a cool greenhouse.—W. W. S.



W.H.F. del et h. l. n.

J.N. Fitch del.

TAB. 17.

Natural Order LILIACEÆ.

Tribe SCILLEÆ.

Genus UROPETALUM, *Ker.*

U. UMBONATUM, n. sp. Bulbo ovato, foliis linearibus duobus supra planiusculis infra convexis scapo subæquantibus, pedicellis secundis nutantibus floribus delapsis bracteis duplo brevioribus, perianthiis cylindricis viridibus, segmentibus interioribus connatis, exterioribus longioribus recurvatis, capsulâ obovatâ oblongâ supra umbonatâ.

A native of the Cape of Good Hope, collected by Mr. Hutton.

Bulb ovate, white, much smaller than in the preceding. *Scape* about a foot high, erect, slender, terete, naked. *Leaves* linear, about a quarter of an inch broad, equalling or slightly exceeding the scape, sheathing it at the base, hemispherically convex in the lower part, flat towards the point, recurved, fleshy in texture, minutely ribbed, glaucous-green, naked. *Raceme* secund, ultimately nearly as long as the scape, with six to nine flowers. *Bracts* lanceolate-acuminate, scariose, twice as long as the *pedicels*, which are ultimately two and a half to three lines long. *Flowers* at first cernuous, finally erecto-patent, green throughout, the inner segments of the *perianth* half an inch long, connate at the edges, shortly patulous at the tips, the outer ones recurved, half as long again, the tips cylindrical. *Stamens* six, equal, one to each segment from the throat of the united tube. *Ovary* obovate-oblong, umbonate upwards, more deeply sulcate than in the preceding. From our *U. Welwitschii* it differs by its smaller and differently shaped bulb, larger bracts, more numerous and shorter flowers, and differently shaped ovary. It has narrower leaves than *U. longifolium*, more numerous flowers, outer divisions of the perianth longer, and inner with less spreading tips.—*J. G. B.*

I received the bulbs of this plant, some years since, from Mr. Plant, who found them in the Natal district of S.E. Africa. It requires the same treatment as the preceding species, and flowers freely.—*W. W. S.*



TAB. 18.

Natural Order LILIACEÆ.

Tribe SCILLEÆ.

Genus DRIMIA, Jacq.

D. COOPERI, n. sp. Foliis oblongo-lanceolatis immaculatis patulis scapo duplo longioribus, racemis multifloris densis scapis æquantibus, pedicellis nutantibus floribus æquantibus, perianthiis viridibus extus purpurascens, tubo laciniis lanceolatis æquante.

An inhabitant of the Cape of Good Hope, imported by Mr. Cooper.

Several *bulbs* diverging from a common centre, an inch and a half to two inches thick, the coats membranous, dark purplish, truncate upwards. *Leaves* about six, four to five inches long, by an inch and a quarter to an inch and a half broad when full-grown, oblong-lanceolate, blunt, succulent in texture, entirely without spots, the veins fine and immersed, both sides bright green, naked, glossy, uniform in colour. *Scape* two to three inches long, erect, terete, green. *Raceme* equalling or finally exceeding the scape, densely thirty- to forty-flowered, the *pedicels* cernuous, nearly as long as the *perianth*, which is campanulate, three-eighths of an inch deep at first, one-fourth of an inch deep when fully expanded, green on the inside, but purplish red on the outside towards the base, the divisions reaching about half-way down, spreading when the flower is fully developed. *Stamens* six, inserted at the base of the segments and about equalling them. *Ovary* roundish, three-celled, with two ovules in each cell. Of the published species it comes nearest to *D. Gawleri* and *lanceæfolia*, from both of which its denser and more copiously flowered racemes, shorter pedicels and leaves, twice as long as the scape, will readily distinguish it.—J. G. B.

Through the exertions of Mr. T. Cooper, I have received this and a number of other species of *Drimia* from South Africa, several of which are new to Science. Many of them are well worth cultivating on account of their beautiful leaves, marked with either dark spots or lines. The species do well in a mixture of decayed turf and sandy loam, with plenty of drainage. They require a light airy greenhouse, and a season of moderately dry rest when the leaves fade.—W. W. S.



W.H.F. del et lith

J.N. Fitch. imp

TAB. 19.

Natural Order LILIACEÆ.

Tribe SCILLEÆ.

Genus DRIMIA, Jacq.

D. APERTIFLORA, *n. sp.* Foliis ligulato-lanceolatis inferne maculatis erectis scapo æquantibus, racemis expansis sublaxis scapis multoties brevioribus, pedicellis nutantibus floribus duplo longioribus perianthii laciniis purpurascensibus ligulatis fere ad basin liberis.

Another new species, also brought by Mr. Cooper from the Cape. It is much nearer the old *D. lanceæfolia* than the preceding, but has much longer leaves spotted only below, a longer scape, a more numerous flowered and closer raceme, and larger flowers.

Bulb ovate, an inch and a half to two inches thick, the coats membranous, purplish brown, truncate upwards. *Leaves* five or six, erect, ligulate-lanceolate, eight or nine inches long when fully developed, about an inch broad, marked with dark purple blotches in the lower part, narrowed gradually from the middle downwards, and upwards to an acute point, texture succulent, colour bright green. *Scape* terete, equalling the leaves, blotched in the lower part. *Raceme* at first crowded, about four inches long and moderately lax when fully expanded, the *bracts* very small and inconspicuous, the *pedicels* finally half an inch long, slightly cernuous. *Perianth* purple, about a quarter of an inch deep, the divisions ligulate, reaching down nearly to the base, exceeding the *stamens*. *Ovary* with six sulcations, those between the three cells the most conspicuous.—*J. G. B.*

This is another of the species of *Drimia* which were sent to me by Mr. T. Cooper, from South Africa. It requires the same treatment as recommended for *D. Cooperi*.—*W. W. S.*





W. H. F. del et lith.

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TAB. 20.

Natural Order LILIACEÆ.

Tribe SCILLEÆ.

Genus ORNITHOGALUM.

O. THYRSOIDES (Jacq. Vind. iii. p. 17, t. 28). Foliis lanceolatis scapo brevioribus reflexis, racemis multifloris densis ovato-thyrsoideis, bracteis ovato-lanceolatis pedicellis brevioribus, perianthii segmentis albis late-oblongis subæqualibus patentibus, filamentis alternis inferne rotundato-dilatatis. — Thunb. Prodr. p. 62; Fl. Cap. 315; Ait. Hort. Kew, edit. 2, vol. ii. p. 261. Redoute, Liliac. t. 333; Bot. Mag. t. 1164; Kunth, Enum. vol. iv. p. 353.

A native of the Cape of Good Hope. The species is well known, but none of the figures which have appeared already give an idea of the plant in its full state of development.

Bulb roundish, about two inches thick, the coat brown-membranous, truncate upwards. *Leaves* three or four, contemporaneous with the flowers, lanceolate, six to eight inches long, an inch and a half to two inches broad, clasping the stem at the base, the apex reflexed, texture moderately fleshy, both sides full green and naked, the venation not conspicuous. *Scape* about a foot high, a quarter to three-eighths of an inch thick, firm, erect, terete, naked. *Bracts* ovate-lanceolate, pale green, about an inch long. *Flowers* in a lax or dense terminal thyrusus, in our specimen about fifty in number, but sometimes as few as a dozen. *Pedicels* an inch and a half to two inches long, the upper ones ascending, the lower ones spreading. *Perianth* pure white, two inches broad when fully expanded, the divisions ovate, bluntish, subequal. *Stamens* one opposite each segment, similar, but the alternate filaments different, three being slightly dilated below, but the other three much more dilated and prolonged into a conspicuous tooth on each side at the apex. *Ovary* bluntly trigonous, the *stigma* slightly exceeding the stamens.—J. G. B.

A remarkably fine species of *Ornithogalum*, from South Africa, sent to this country, some years since, by Mr. T. Cooper. It flowers freely, cultivated in rich turfy loam, and with a liberal supply of water during the season of growth. Cool greenhouse treatment seems to suit the plant best, with plenty of light and air. When at rest it should be dry and moderately warm.—W. W. S.



TAB. 21.

Natural Order LILIACEÆ.

Tribe ASPARAGEE.

Genus ASPARAGUS, Linn.

Section ASPARAGOPSIS, Kunth. Flores hermaphroditi, ovarium liberum triloculare, ovula in loculis 3—9, bacca globosa, abortu 1—2 sperma.

- A. SCANDENS (Thunb. Prodr. 63). Glabra, caulibus herbaceis, ramosisissimis, inermibus, volubilibus, ramis angulatis, ramulis acutangulis, foliis subternis, planis, linearibus, subfalcatis, stipulis profunde dentatis, pedicellis solitariis pendulis supra medium articulatis, perianthio segmentis inæqualibus patentibus. — Ait. Hort. Kew, edit. 2, vol. ii. p. 273; Schult. Syst. vol. vii. p. 325. Asparagopsis scandens, Kunth, Enum. vol. v. p. 78.

A native of the Cape of Good Hope.

Stems several feet high, climbing, herbaceous, the main branches horizontal, the branchlets naked, slender, deeply channelled. *Leaves* linear, dark green, glossy, naked, firm in texture, slightly falcate, three or four lines long, those of the ultimate shoots spreading nearly in a plane, usually in threes, casually in twos and fours. *Stipules* lanceolate-acuminate, membranous, deeply toothed. *Pedicels* from the axils of the clusters of leaves, slender, drooping, naked, articulated above the centre, solitary or casually geminate, three or four lines long. *Expanded flowers* four lines across, white, except that the keel has a slight greenish tinge, oblong, patent, slightly toothed, the alternate ones rather smaller. *Stamens* rather shorter than the segments of the *perianth*, one from the base of each. *Ovary* bluntly trigonous, with shallow sulcations. *Berry* round, four lines thick.—J. G. B.

This elegant plant, of delicate fern-like foliage, is of very rapid growth, and very suitable for conservatory decoration. It will easily climb up a small cord, and then can be moved without difficulty from place to place, and be shown in situations where it will produce the best effect. It makes fresh growth from the ground every year. I find a rich turfy loam suits it well.—W. W. S.



W H F del et lith.

J.N. Et

TAB. 22.

Natural Order AMARYLLIDACEÆ.

Tribe PANCRACTEÆ.

Genus STENOMESSON, *Herb.*

S. SUSPENSUM, *n. sp.* Foliis linearibus scapo æquantibus, spathis bivalvis pedicellis subæquantibus, floribus 4—6 nutantibus coccineis, tubo cernuo gracili segmentis oblongis imbricatis duplo longiore, coronâ longe exserta sine dentibus interstamineis.

A native of Peru, gathered by Mr. Fraser.

Bulb ovate, an inch thick, the coats dark brown, papyraceous, truncate upwards. *Leaves* two, linear, acute, a foot long, half an inch broad, glaucous-green, flat, fleshy, naked, the midrib prominent beneath. *Scape* firm, erect, naked, equalling the leaves. *Spathes* two-leaved, lanceolate, an inch and a half long. *Flowers* four to six, drooping, the *pedicels* about an inch long, scarcely protruding from the clasping spathes. *Perianth* an inch and a half long, the tube half its length, not more than an eighth of an inch thick below, but dilated upwards, the divisions half an inch deep, oblong, imbricated, the outer ones blunt, the inner ones subacute, both bright scarlet on both sides like the tube. *Stamens* equalling the *perianth*, the filaments dilated at the base and quite close together, without any teeth between them, exceeding the *corona*. *Style* slightly exserted. *Capsule* hardly at all angular.

Like *S. Hartwegii*, Lindl. Bot. Reg. 1844, t. 22, this differs from the character of *Stenomesson*, as laid down in Kunth, by the staminal corona being entirely without teeth between the stamens, but we do not separate it, from a belief that when the Order is revised it will be found best to join these with the true *Stenomessons* and *Coburgias* in one genus, regarding the nature of the fringe of the staminal corona as furnishing characters of sectional value only.—*J. G. B.*

I received this interesting bulbous plant, some years since, from Mr. Fraser, who collected it in Peru. It requires warm greenhouse treatment, and should be grown in a mixture of loam and peat. It should be kept well watered while growing, and allowed to rest dry and warm.—*W. W. S.*



TAB. 23.

Natural Order IRIDACEÆ.

Tribe GLADIOLEÆ.

Genus GLADIOLUS, Linn.

G. TRISTIS (*Thunb. Fl. Cap.* p. 42). Bulbo fibroso, scapo 3—4 foliato, foliis inferne longe vaginantibus superne linearibus profunde bisulcatis, spathis inæqualibus, floribus 2—8, corollæ segmentis tubo subæqualibus ovatis longe caudatis maculis parvis copiosis rufo-brunneis, filamentis antheris duplo longioribus, stigmatibus divergentibus obcordatis, capsulâ oblongâ, seminibus late alatis. — *Klatt, Linn.* vol. xxxii. p. 715; *Bot. Mag.* t. 1098. *G. elongatus, Ecklon, non Thunb.*

A native of the Cape of Good Hope.

Bulb clothed with a dense network of brown fibres. *Stem* erect, terete, simple, naked, with three to four leaves and two to eight flowers. *Leaves* with long cylindrical sheaths below, the free part four to six inches long by about two lines broad, almost tetragonous, with two deep regular channels on both sides between the raised edges and the broad raised midrib. *Valves of the spathe* unequal, the outer one ovate-lanceolate, about equalling the tube of the corolla, the inner one smaller. *Flowers* cernuous, secund or distichous, two to three inches deep. *Corolla-tube* infundibuliform, rather shorter than the divisions, which are ovate with remarkably long narrow tail-like points, the groundwork yellow, the three upper ones minutely spotted all over both externally and internally with small reddish brown dots, the three lower ones narrower and spotted only on the outer half, all, especially the upper ones, with a darker keel. *Filaments* twice as long as the yellow *anthers*. *Stigmas* obcordate, spreading, papillose. *Capsule* oblong. *Seeds* broadly winged.—*J. G. B.*

Mr. Thos. Cooper sent me bulbs of this plant from Natal. It will thrive in a mixture of rich sandy loam and leaf-mould, and should be kept in a pit or greenhouse from which the frost is excluded.—*W. W. S.*



W. L. F. & Co.

J. N. F.

TAB. 24.

Natural Order IRIDACEÆ.

Tribe SISYRINCHIEÆ.

Genus HOMERIA, Vent.

- H. FLEXUOSA (*Sweet. Hort. Brit.* p. 395). Bulbo sæpe duplici comoso imbricato; scapo tereti flexuoso pluriarticulato ramoso basi trifoliato, foliis fistuloso-vaginantibus convoluto-linearibus scapo brevioribus, spathis multifloris multivalvibus, valvis exterioribus herbaceis cucullato-convolutis basi articulos involventibus cuspidatis subæquantibus; floribus remote appresso-spicatis luteis; perianthii laciniis subspathulato-oblongis æqualiter explanatis, unguibus in cyathum clausis, stigmatibus sexfido ramis patentibus.—*Moræa flexuosa*, Linn. *Suppl.* 100; *Thunb. Diss.* No. 12; *Prodr.* 11; *Willd. Sp. Pl.* i. 243; *Bot. Mag.* 695. *Ixia longifolia*, Jacq. *Hort. Vind.* vol. iii. t. 90. *H. spicata*, Sweet. *F. W. Klatt*, Linn. xxxiv. p. 626.

A native of the Cape of Good Hope.

Bulb three-quarters of an inch thick, often double, the coats brown, fibrous. *Scape* twelve to eighteen inches high, firm, slender, naked, dark green, with numerous articulations. *Leaves* three, one from each of the lowest articulations, convolute, subfistulose, shorter than the scape, dark green, naked; upper articulations each with a short clasping spathe-like bract, membranous at the borders. *Flowers* in a spike sometimes a foot long, distant, the *spathes* about equalling the *pedicels*, the flowers bright yellow, an inch and a half broad when fully expanded, the divisions oblong-spathulate, with a green streak down the middle reaching three-quarters of the way down, nearly equal, the *stamens* united into a tube below, the *style* densely six-cleft with spreading rays. *Capsule* half an inch long, hardly at all sulcate.

We figure this principally for the sake of showing clearly the character of the style, which is very anomalous. Dr. F. W. Klatt, of Hamburg, who has recently contributed to the 'Linnæa' an elaborate monograph of the *Iridaceæ*, unites together three of Sweet's *Homeriæ*—*spicata*, *flexuosa* and *virgata*—as one species.—J. G. B.

This is an old and well-known plant, brought forward again to point out some peculiarities of structure. It flowers freely treated as an *Ixia*.—W. W. S.

Explanation of the Plates in 'Refugium Botanicum,' Part II.

Tab. 25.—BILLARDIERA CYMOSA.

1, flower with corolla taken away; 2, separate petal; 3, anther; 4, pistil; 5, horizontal section of ovary: all magnified.

Tab. 26.—MAHERNIA CHRYSANTHA.

1, flower with corolla and calyx taken away; 2, pistil; 3, horizontal section of ovary: all magnified.

Tab. 27.—PELARGONIUM RUTÆFOLIUM.

1, side view of flower; 2, front view of flower; 3, upper petal; 4, side petal; 5, lower petal; 6, flower with calyx and corolla removed: all magnified.

Tab. 28.—PELARGONIUM SISONIFOLIUM.

1, lower leaf after the plant has flowered, natural size; 2, flower complete; 3, upper petal, both magnified.

Tab. 29.—PELARGONIUM FUMARIOIDES.

1, side view of complete flower; 2, flower from above; 3, flower with calyx removed; 4, flower with calyx and corolla removed; 5, pistil; 6, fruit: all magnified.

Tab. 30.—PELARGONIUM HISPIDUM.

1, flower complete; 2, upper petal: both magnified.

Tab. 31.—ACACIA STRIGOSA.

1, portion of branch with cluster of flowers; 2, a separate flower: both magnified.

Tab. 32.—SEDUM SPECTABILE.

1, complete flower; 2, carpels of ditto: both magnified.

Tab. 33.—SEDUM ALBO-ROSEUM.

1, complete flower; 2, carpels of ditto: both magnified.

Tab. 34.—SEDUM CORDIFOLIUM.

1, complete flower; 2, carpels of ditto: both magnified.

Tab. 35.—COTYLEDON MACULATA.

1, pair of flowers; 2, corolla opened; 3, hypogynous scales and horizontal section of the carpels: all magnified.

Tab. 36.—*COTYLEDON RHOMBIFOLIA*.

1, cluster of flowers ; 2, corolla opened ; 3, hypogynous scales and horizontal section of the carpels : all magnified.

Tab. 37.—*SOLANUM ROBUSTUM*.

1, expanded flower ; 2, pistil : both magnified.

Tab. 38.—*FLEURYA ÆSTUANS*.

1, raceme of female flowers ; 2, male flower expanded ; 3, developed female flower ; 4, fruit : all magnified.

Tab. 39.—*EUPHORBIA TETRAGONA*.

1, complete flower, with pair of bract-like leaves ; 2, scale from the throat of the involucre ; 3, male flower ; 4, its bract ; 5, developed female flower : all magnified.

Tab. 40.—*PEPEROMIA MAGNOLIÆFOLIA*.

1, part of a spike ; 2, a single flower ; 3, lateral view of the same : all magnified.

Tab. 41.—*PEPEROMIA MICROPHYLLA*.

1, spike with uppermost whorl of leaves ; 2, front view of flowers ; 3, side view of flower ; 4, pistil : all magnified.

Tab. 42.—*TRITELEIA AUREA*.

1, pistil ; 2, horizontal section of ovary ; 3, stamen : all magnified.

Tab. 43.—*TRITELEIA CONSPICUA*.

1, flower opened out ; 2, stamen ; 3, horizontal section of ovary : all magnified.

Tab. 44.—*ALBUCA FASTIGIATA*.

1, petal from inner row ; 2, stamens and pistil ; 3, stamen opposite inner petal ; 4, pistil ; 5, horizontal section of ovary : all magnified.

Tab. 45.—*ALBUCA CAUDATA*.

1, petal from inner row ; 2, stamens and pistil ; 3, pistil : all magnified.

Tab. 46.—*PHÆDRANASSA CARMIOLE*.

1, vertical section of flower ; 2, anther and part of filament ; 3, stigma and part of style ; 4, horizontal section of ovary : all magnified.

Tab. 47.—*MYRSIPHYLLUM FALCATUM*.

1, portion of branch with flowers ; 2, separate flower ; 3, pistil ; 4, horizontal section of ovary : all magnified.

Tab. 48.—*TRADESCENTIA DISCOLOR*, *var.* *CONCOLOR*.

1, side view of closed flower ; 2, expanded flower ; 3, stamen ; 4, moniliform hair of filament ; 5, pistil : all magnified.



W.H. Fitch, del. et lith.

J.N. Fitch

Billardiera cymosa, *Pro Muehl.*

TAB. 25.

Natural Order PITTOSPORACEÆ.

Genus BILLARDIERA, Smith.

B. CYMOsa (*F. Muell, Trans. Vict. Inst.* i. p. 29). Caulibus flexuosis subglabris, foliis oblongo-lanceolatis subsessilibus, floribus in cymis subsimplicibus 4—6 floris sessilibus vel breviter pedunculatis aggregatis, pedicellis calyce longioribus, sepalis lineari-lanceolatis subglabris vel paullulum sericeis, corollæ segmentis patulis violaceis oblongo-lanceolatis tubo æquantibus, baccis glabris oblongis.—*Benth. Fl. Austral.* vol. i. p. 124. *B. cymosa* and *pseudo-cymosa*, *Klatt, Linnæa*, xxviii. p. 571.

A native of the colonies of Victoria and South Australia.

A low shrub, with firm, slender, diffuse or slightly climbing branches. The old stems bright brown and naked, the young ones green and inconspicuously gray-silky upwards. *Stipules* none. *Leaves* sessile or nearly so, alternate, oblong-lanceolate, the largest fifteen to eighteen lines long by about half an inch broad, the point acute or subobtuse, the edge quite entire, the base narrowed, the texture chartaceous, the colour a uniform pale green on both sides, the veins not conspicuous. *Flowers* in short-stalked or sessile terminal cymes of four or six flowers each. *Bracts* lanceolate. *Pedicels* three to six lines long, firm, erect, usually slightly silky, often bracteolate. *Calyx* an eighth of an inch deep, cut down to the base, subglabrous or inconspicuously silky; the *sepals* linear-lanceolate. *Corolla* half an inch deep, divided about half-way down, the tube greenish-white on the outside, the divisions spreading horizontally when the flower is fully expanded, oblong-lanceolate, acuminate or cuspidate, violet-coloured, a line and a half or two lines broad. *Ovary* clavate, finely silky, completely two-celled, with a short style and a broad hollow stigma. *Fruit* a small oblong berry, with numerous seeds enveloped in pulp.—*J. G. B.*

This is a neat and pretty little sub-climbing plant, which thrives well in a dry airy greenhouse, grown in sandy turfy peat, and not too much pot room. It is impatient of much moisture at the root. I am indebted to my friend S. Solly, Esq., F.R.S., for the seeds of this plant, which he received from South Australia.—*W. W. S.*



W.H. Fitch, del. et. lith.

J.N. Fitch, imp.

Mahernia chrysantha, Planch.

TAB. 26.

Natural Order STERCULIACEÆ.

Genus MAHERNIA, Linn.

M. CHRYSANTHA (*Planchon in Herb. Hook.*) Caulibus decumbentibus griseo-pubescentibus, stipulis profunde incis, foliis breviter petiolatis cordato-oblongis obtusis crenulatis sursum rugosis demum subglabris deorsum dense griseo-lanosis, pedunculis elongatis plerisque bifloris, calycibus turbinatis dense griseo-vestitis dentibus deltoideis tubo æquantibus, petalis obovato-spathulatis calyce multo excedentibus. — *Turcz. Mosc. Bull.* 1858, p. 219. *Harr. Fl. Cap.* vol. i. p. 218.

A native of Cape Colony.

A low shrub, with slender, woody, prostrate stems, densely clothed with spreading gray woolly hairs. *Stipules* and *bracts* often cut more than half-way down into linear teeth. *Petioles* spreading, alternate, a quarter to half an inch long, firm, clothed like the stems. *Leaves* oblong or rather ovate, an inch and a half to three inches long, an inch to an inch and a half or more broad, blunt, the base cordate, the edge crenulate, the texture thick but pliable, the upper surface dull green and corrugated like a sage-leaf, slightly downy at first, but becoming naked; the under surface densely matted with gray woolly down, like that of the stems. *Flowers* on *peduncles* one to two inches long, from the axils of the leaves, usually two together; the *pedicels* cernuous. *Calyx* turbinate, half an inch deep, densely gray-woolly like the rest of the plant, with deltoid teeth which reach about half down. *Petals* half as long again as the calyx, obovate-spathulate, pubescent, in our specimens pure white. *Ovary* obovate, densely tomentose.—*J. G. B.*

This plant was reared from seeds sent from South Africa by Mr. Thos. Cooper. It requires greenhouse treatment in winter, but is admirably adapted for decorating rock-work in the open air in the summer time. It will thrive well on light sandy loam or any good garden soil. It flowers freely, and produces a very pretty effect when allowed to spread at its pleasure.—*W. W. S.*



W. H. Fitch, del et hth.

J. N. Fitch, pin.

Pelargonium rutæfolium, Baker.

TAB. 27.

Natural Order GERANIACEÆ.

Tribe PELARGONIÆÆ.

Genus PELARGONIUM, *L'Herit.*

SECT. HOAREA. Acaulis, radicibus magnis, tuberiformibus vel fusiformibus carnosis, floribus quadri- vel quinque-petalis.

P. BUTÆFOLIUM, n. sp. Petiolis breviter pubescentibus, foliis ligulato-lanceolatis pinnis subplanis paullulum pubescentibus late rhomboideis breviter petiolatis contiguis subdichotomo-dissectis divisionibus primariis paucis divergentibus ultimis linearibus acutis, scapo foliis æquante, sepalis linearibus albo-marginatis omnino reflexis, petalis calyce æquantibus, superioribus anguste spathulatis citrinis contiguis reflexis, inferioribus latioribus rectis carnosio-rubris inter se conniventibus.

A native of the Cape of Good Hope, imported by Mr. Cooper.

Root roundish or subfusiform, an inch or more thick, with a loose brown skin. *Leaves* all radical, on erect, firm, herbaceous *petioles* one to three inches long, thinly clothed with short, spreading, soft, gray hairs; the blade ligulate-lanceolate, four or five inches long when fully developed, by twelve to fifteen lines broad, the main divisions pinnately arranged, broadly rhomboidal, spreading nearly in a single plane, nearly or quite contiguous, all except the uppermost with a short distinct stalk, subdichotomously forked, with divergent main divisions and linear acute ultimate segments, about a line broad at the base, the texture herbaceous, both sides pale green and slightly and inconspicuously downy. *Scape* erect, about equalling the leaves, a little downy. *Flowers* six to twelve in an *umbel*, which is surrounded by a whorl of small linear-lanceolate slightly downy *bracts*; the fully-developed *pedicels* nearly an inch long; the *calyx-tube* exceeding the *sepals*, which are linear-lanceolate, slightly pubescent, half an inch long, herbaceous in the middle, with a white border, recurved from the base so that their backs touch one another when the flower is fully expanded; the two upper *petals* primrose-yellow, veined with bright scarlet in the throat, narrowly spathulate, recurved from about two-thirds of the way down when the flower is expanded; the three lower ones pale flesh-coloured, as long as the upper ones and rather broader,

standing forward and pressed together very like the wings and keel of a papilionaceous flower. *Fertile stamens* five.

This is a fourth species, which we cannot find anywhere described, of the same group as the *P. rapaceum*, *nutans*, and *corydalifolium* of DeCandolle's 'Prodromus,' which are placed by Harvey in the Cape flora as varieties of a single species. In the peculiar character of the calyx and corolla they all agree, but differ considerably in the colour of the petals, the character of the leaves, and pubescence of the stem and other parts of the plant.—*J. G. B.*

The *Pelargoniums* of this section are interesting and peculiar, on account of their large carrot-like tuberous stem, the larger portion of which is buried in the ground. They lie dormant during the summer season, and should be potted and started into growth early in the autumn. They require a light airy greenhouse, and, properly treated, flower freely. Tubers of this species were sent to me from South Africa by Mr. Cooper.—*W. W. S.*



W.H. Fitch, del. et lith.

J.N. Fitch, m.

Pelargonium sisonifolium, Baker.

TAB. 28.

Natural Order GERANIACEÆ.

Tribe PELARGONIÆÆ.

Genus PELARGONIUM, *L'Herit.*

Sect. OTIDIA. Radice crasso furcato, caulibus erectis, crassis, nodosis, foliis pinnatis vel bipinnatis, floribus parvis, petalis superioribus auriculatis.

P. *SIONIFOLIUM*, *n. sp.* Caulibus paullulum pubescentibus, foliis longe petiolatis breviter pubescentibus oblongis lyrato-pinnatis segmentis subrhomboideis contiguis late foliaceis inciso-dentatis, umbellis 4—6 floris, pedicellis perbrevis, calycis segmentis oblongo-lanceolatis albo-marginatis, petalis albis introrsum rubro-venosis superioribus ligulato-spathulatis calyce excedentibus, inferioribus minoribus calyce subæqualibus.

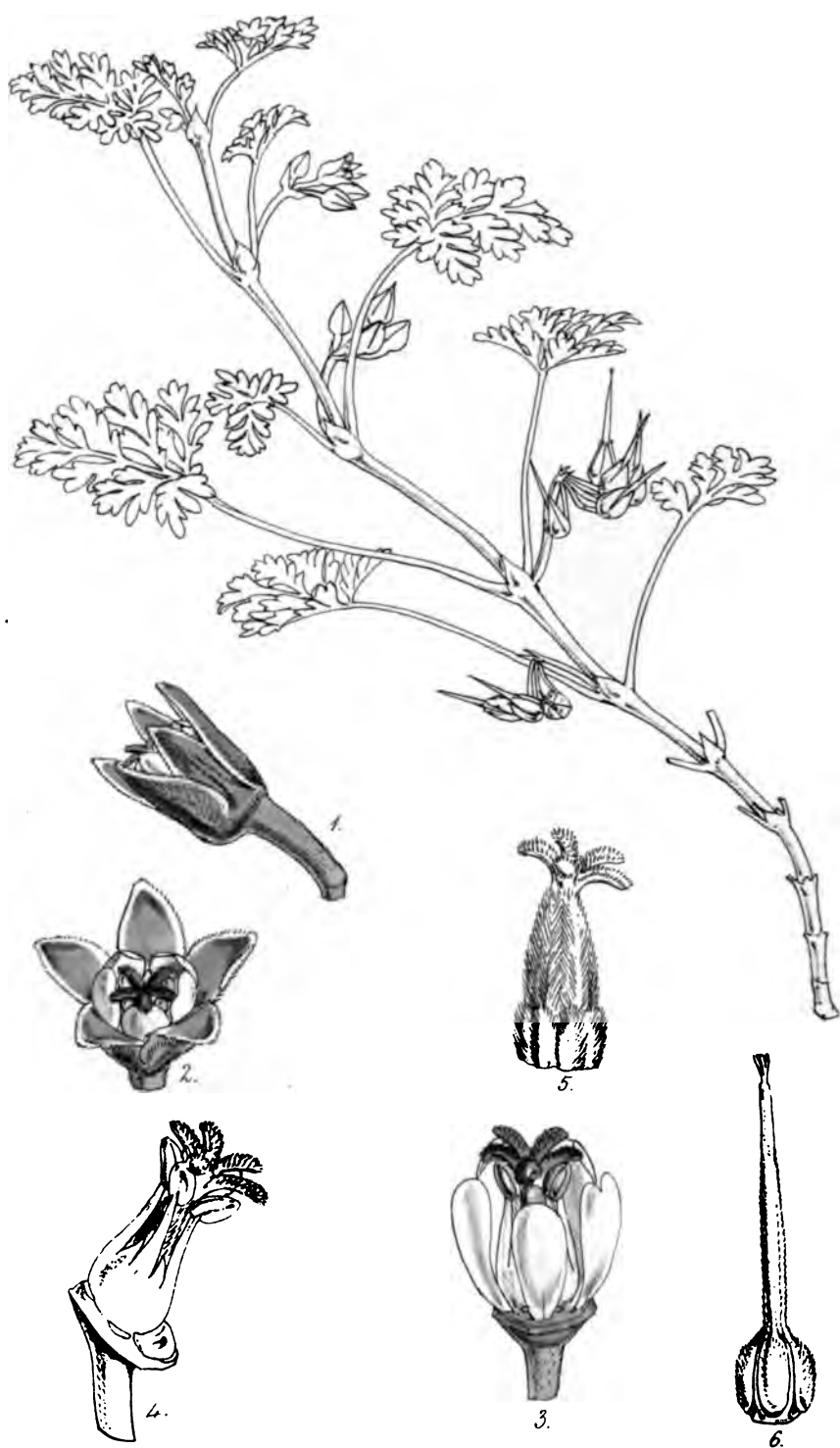
Imported from the Cape by Mr. Cooper.

Root thick, succulent, nodose, branched, the outer coat pale brown. *Stem* branching copiously from the crown of the root, the main branches a quarter to three-eighths of an inch thick at the base, pale green, finely and shortly gray-downy, swollen at the nodes, about a foot high when the plant is in flower. *Stipules* minute, thick, lanceolate. *Petioles* about an inch long when the plant is in flower, the lower ones finally two or three inches long, finely and shortly gray-downy like the stem. *Leaves* oblong in general outline, quite herbaceous in texture, pale green, finely downy, two or three inches long when the plant is in flower, by about an inch and a half broad, pinnate below, with rhomboidal deeply-toothed bluntish divisions, which are not more than half an inch broad at first, but afterwards enlarge considerably, the lower divisions cuneate at the base, the lower pair often a distance apart from the rest, the central divisions forming a decurrent wing to the petiole, those of the upper third of the leaf not reaching down to it. *Flowers* in copious close umbels of four to six flowers each, on terminal peduncles, which are cernuous at first, but by the time the flowers open become erect and are three or four inches long. *Bracts* small, inconspicuous. *Pedicels* very short, a little downy, like the calyx, the divisions of which are oblong-lanceolate, about a quarter of an inch long, bluntish or subacute, bordered with white. *Petals* pure white, with a few

bright red veins in the throat, the upper pair close together, ligulate-spathulate, about an eighth of an inch broad, considerably exceeding the calyx, the three lower ones shorter and narrower.

Of the described *Otidia* this appears to be nearest to *P. polycephalum*, E. Meyer, which differs by its nearly or quite naked stems; more fleshy leaves, with more distant divisions, which are cut more deeply, but not nearly so much toothed; more branched stems; larger and more membranous bracts; and more numerous flowers in an umbel.—*J. G. B.*

The section *Otidia* of the large genus *Pelargonium* contains plants having half-succulent thickened stems and tender succulent leaves, giving them a very marked and peculiar appearance. They grow freely in a cool well-ventilated greenhouse, potted in a mixture of sandy loam and leaf-mould. During the season of rest they want but little water, and it is dangerous to place them in the open air without they are secured from too much rain. The species figured I obtained from South Africa, where it was discovered by Mr. Thos. Cooper.—*W. W. S.*



W. H. Fitch, del. et. lith.

J. N. Fitch

Pelargonium fumarioides, L. Herib.

TAB. 29.

Natural Order GERANIACEÆ.

Tribe PELARGONIÆ.

Genus PELARGONIUM, *L'Herit.*

Sect. PERISTERA. Annuum vel biennis, caulibus herbaceis prostratis diffusis, foliis dissectis, stipulis membranaceis, floribus minutis, petalis subæqualibus, calyce subæquantibus vel brevioribus, staminibus fertilibus 5.

P. FUMARIOIDES (*L'Herit. in Herb. Banks.*) Petiolis longis paullulum argenteis, foliis deltoideis subglabris bi- vel tripinnatifidis segmentis ultimis linearibus, umbellis 6—8 floris breviter pedunculatis, pedicellis demum calyce multo excedentibus, calycis tubo subnullo, sepalis oblongo-lanceolatis argenteis petalis excedentibus. — *Harv. Fl. Cap.* i. p. 290. *P. parvulum*, *E. and Z. non D.C.* *P. columbinum*, *E. Meyer, non Jacq.*

A native of the Cape of Good Hope.

One of the least showy members of this great genus, a plant in general aspect looking far more like one of our humble English *Geraniums* than the kinds commonly cultivated, and by the character of its calyx having almost as much claim to be considered an *Erodium* as a *Pelargonium*, to which former genus Zeyher has already referred it. *Roots* annual or biennial, producing at the crown a large number of copiously-branched diffuse slender herbaceous *stems*, which are nearly naked below, but become slightly argenteous upwards. *Stipules* small, membranous, deltoid-acuminate. *Petioles* slender, those of the upper leaves short, of the lower ones one to two inches long. *Leaves* deltoid in general outline, bi- or tripinnatifid, with close main divisions and linear ultimate ones, herbaceous in texture, full green and nearly naked on both sides. *Flowers* in short-stalked *umbels* of six to eight flowers each, from the axils of the leaves. *Pedicels* at first very short, finally two or three lines long, decurved, and then again upcurved when the fruit is developed, more or less argenteous; the *bracts* membranous, lanceolate-acuminate. *Calyx-tube* very short, the divisions about an eighth of an inch deep, oblong-lanceolate, obtuse, densely clothed on the outside with silvery pubescence. *Petals* bright crimson or white, subequal, oblanceolate, emarginate at the apex, considerably shorter than the *sepals*.

Styles in fruit half an inch long, like the *carpels* considerably argenteous.—J. G. B.

This small-flowered species of *Pelargonium*, with petals so minute as to be enclosed within the sepals, was reared by Mr. Thos. Cooper, from seed which he obtained in South Africa. It requires very careful watering during the winter, and should be grown in a cool greenhouse, in sandy loam and leaf-mould well drained.—W. W. S.



W.H.Fitch, del. et lith.

J.N.Fitch, imp.

Pelargonium hispidum, Willd.

TAB. 30.

Natural Order GERANIACEÆ.

Tribe PELARGONIÆÆ.

Genus PELARGONIUM, L'Herit.

Sect. PELARGIUM. Frutices ramosæ, foliis simplicibus vel palmatim nunquam pinnatim lobatis, stipulis liberis, umbellis copiosis, petalis inæqualibus, staminibus fertilibus 7.

P. HISPIDUM (Willd. *Sp. Plant.* iii. p. 677). Caulibus deorsum fruticosis, sursum herbaceis furcatis dense hispidis, foliis longe petiolatis cordato-deltoides nervosis utrinque griseo-pubescentibus palmatifidis, divisionibus lobatis denticulatis, stipulis late deltoides, paniculis latis amplis copiose dichotomis umbellis multis 5—8 floris, pedunculis erecto-patentibus, pedicellis hispidis calyce brevioribus, sepalis oblongo-lanceolatis hispidis tubo brevioribus, petalis inæqualibus superioribus anguste obovato-cuneatis erectis calyce valde longioribus, inferioribus patulis parvis linearibus calyce æquantibus.—*D.C. Prodr.* vol. i. p. 679; *Harv. Fl. Cap.* i. p. 307.

A native of Cape Colony.

Lower part of the *stem* woody to the height of sometimes a foot, the upper part herbaceous, firm, erect, copiously branched and striated, densely clothed throughout with conspicuous spreading gray hairs. *Stipules* membranous, broad deltoid, three or four lines long, cuspidate. *Petioles* firm, erecto-patent, pubescent, of the upper leaves an inch, of the lower reaching three or four inches long. *Leaves* deltoid in general outline, when well-developed three to five inches long and broad, deeply cordate at the base, with numerous palmate lobes reaching about half down to the midrib, which are again pinnatifid, and the edge all round finely serrato-denticulate, the texture quite herbaceous, the upper surface full green, the lower paler, both soft with copious shining gray hairs, the numerous veins conspicuous on both sides, being channelled above and raised beneath. A well-developed *stem*, copiously dichotomously branched at the top, and producing twenty to thirty *umbels* of three to eight flowers each, on erecto-patent downy *peduncles*, one to two inches long. *Pedicels* at the flowering time three or four lines long, hispid; the lanceolate-acuminate membranous *bracts* rather shorter; the *calyx-tube* two lines deep; the oblong-lanceolate *sepals* three and

a half to four lines deep, all more or less hispid. *Corolla* white or reddish lilac; the two upper *petals* narrowly obovate-cuneate, four lines broad, erect and considerably exceeding the sepals, and marked with dark veins in the throat; the three lower ones much narrower, spreading, and about equalling the calyx.—*J. G. B.*

A very beautiful free-flowering species of *Pelargonium*, of easy cultivation, potted in rich loam, leaf-mould and sand. In habit it somewhat resembles the old favourite *P. tomentosum*, and its leaves have the same perfume although not so strong. The plant should be grown in rich loam, leaf-mould and sand, and requires an airy greenhouse during the winter, but in summer it may be freely exposed to the open air. It was reared from seed sent to this country from South Africa by Mr. Thos. Cooper.—*W. W. S.*



W.H. Fitch, del. et lith.

J.N. Fitch, imp.

Acacia strigosa, Link.

TAB. 31.

Natural Order LEGUMINOSÆ.

Sub-order MIMOSÆ.

Tribe ACACIÆ.

Genus ACACIA, Willd.

- A. STRIGOSA** (Link. Enum. Hort. Berol. vol. ii. p. 444). Ramis strigosis, stipulis minutis scariosis linearibus, foliis subsessilibus æqualiter bipinnatis, pinnis plerisque bijugis, foliolis 4—6 jugis sessilibus oblongis-strigosis, pedunculis foliis æquantibus, capitulis parvis congestis globosis 12—15 floris, calycibus turbinatis truncatis, corollis staminibus duplo brevioribus, seminibus transversis.—*D.C. Prodr.* vol. ii. p. 466; *Benth. Fl. Austral.* vol. ii. p. 419. *A. ciliata*, R. Br. non Willd. *A. Browniana*, Wendland, *Flora*, 1819, p. 139.

A native of Western Australia.

An unarmed shrub, attaining a height of two to four feet, with slender striated woody branches, which are naked when old, but more or less densely clothed when young with spreading gray hairs. *Stipules* minute, linear, scariose. *Leaves* nearly or quite sessile, the fully-developed ones bipinnate, with two opposite pairs of *pinnae*, the main *rachis* two or three lines long, tipped with a bristle, the *pinnae* with four or five pairs of oblong obtuse sessile leaflets, which are an eighth of an inch or two lines long, firm in texture, full-green in colour when young, more or less hispid on both sides, the edges revolute when dry. *Flowers* in dense rounded heads from the axils of the leaves, on slender firm pubescent *peduncles* three to six lines long, which about equal the leaves; flowers twelve to fifteen in a head; the *calyx* turbinate, green, pubescent, half as long as the *corolla*. *Petals* boat-shaped, not more than half as long as the very numerous yellow *stamens* when the flower is fully expanded. *Pod* about an inch long and a quarter of an inch broad, leathery in texture and dark brown in colour, naked, narrowed at both ends, the faces flattened and valves much thickened, containing six or eight transverse seeds.—*J. G. B.*

This is a very ornamental small species of *Acacia*, growing freely in a cool greenhouse or conservatory, and producing a large quantity of bright yellow flowers. It thrives in a soil of sandy peat and leaf-mould. It was raised from seed obtained from South Australia by my friend S. Solly, Esq., F.R.S.—*W. W. S.*



W.H. Fitch, del., et lith.

J.N.I

Sedum spectabile, Boreau.

TAB. 32.

Natural Order CRASSULACEÆ.

Genus SEDUM, Linn.

S. SPECTABILE (*Boreau, Monogr. de quelques Sedums*, p. 7). Foliis ternis vel oppositis pallide virentibus patulis obovato-spathulatis denticulatis basi subcuneatis, corymbis amplis densis subplanis ramis primariis oppositis, pedicellis floribus brevioribus, sepalis lanceolatis petalis triplo brevioribus, petalis pro genere magnis lanceolatis patulis lilacino-roseis, staminibus longioribus petalis multo excedentibus, carpellis rostratis petalis concoloribus æquantibus. — *Anacampteros spectabile*, *Jordan and Fourreau, Ic. Fl. Eur.* p. 37, t. 100. *Sedum Fabaria*, *Lemaire, Illust. Hort.* vol. viii. t. 271, non Koch.

A native of Japan.

Stems several from a root, glaucous-green, ascending, a quarter of an inch thick at the base. *Leaves* usually in whorls of three, sometimes in pairs, and on weak shoots occasionally solitary, obovate-spathulate, spreading nearly horizontally, two and a half to three inches long when well-developed, by about half as broad, bluntly and distantly toothed, cuneately narrowed at the base, nearly flat, in colour a pale bright slightly glaucous-green, the whorls about an inch and a half apart. Main branches of the corymb arising from the same point, the *bracts* of which are like the leaves, but only about half as long. *Corymb* almost flat-topped, in well-developed plants four or five inches across. *Bracteoles* small, linear. Ultimate *pedicels* three or four lines long, pale glaucous-green. *Calyx* an eighth of an inch deep, the divisions lanceolate, a very pale green and not at all spotted. *Petals* lanceolate, three-eighths of an inch deep, narrowed gradually to an acute point, magenta-red, spreading, when the flower is fully expanded, from three-quarters of the way down, so that the *corolla* then measures quite half an inch across. *Stamens* generally in two sets of five each, those opposite the petals attached a short distance above their base and considerably exceeding them, the inner row attached quite at the bottom of the corolla, just equalling both it and the long-pointed *carpels*, which are both the same length and the same colour as the petals. *Hypogynous scales* spathulate, conspicuously emarginate at the apex.

This is the plant commonly cultivated in English gardens as *Sedum Fabaria*, a name to which it has no sort of claim, the true plant of Koch being a totally different species of the same group, which grows wild in many parts of England, and is very near the common *S. Telephium*, coinciding with it in general habit and the size and colour of its flowers, differing from it principally in the insertion of the stamens and narrower leaves.—*J. G. B.*

This fine and beautiful species of *Sedum* is quite hardy, and produces its large heads of delicate rose-coloured flowers freely in the open air. It is also a most useful plant for conservatory decoration when grown in pots, as its flowers are of long duration. A strong loamy soil seems to suit it best, and it will accommodate itself to either sun or shade.—*W. W. S.*



W. H. Fitch, del. et lith.

J. N. Fitch, imp.

Sedum alboroseum, Baker.

TAB. 33.

Natural Order CRASSULACEÆ.

Genus SEDUM, Linn.

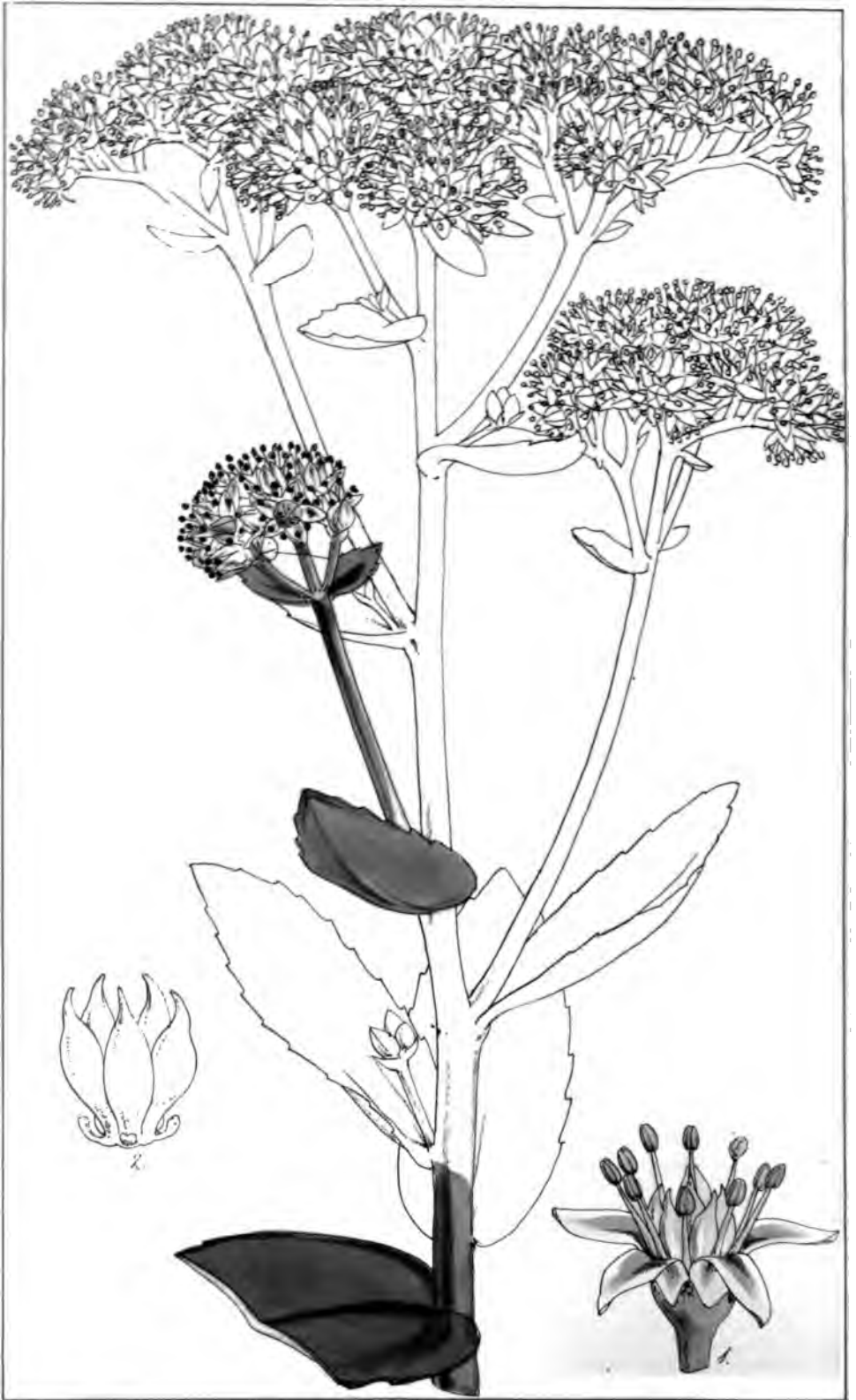
- S. ALBO-ROSEUM, n. sp. Foliis sparsis pallide virentibus oblongo-spathulatis subacutis ascendentibus denticulatis basi angustatis, corymbis amplis densis rotundatis ramis primariis alternis, pedicellis floribus dimidio brevioribus, sepalis deltoideis pallide viridibus immaculatis petalis triplo brevioribus, petalis albis lanceolatis patulis, staminibus et carpellis rostratis roseis petalis æquantibus.

A native of Japan.

Stems several from a root, ascending, about a foot and a half long, glaucous-green, quite naked, like the whole plant. *Leaves* close, arranged in spires of four, never opposite, ascending and slightly convex in the lower part, oblong-spathulate, the largest about two inches and a half long by half as broad, the point subacute, the edge of the upper two-thirds slightly inciso-crenate, the lower third entire, the base so much narrowed that when the leaves fall off they leave a roundish scar, the colour a pale bright slightly glaucous-green. *Corymb* three or four inches broad when well-developed, its separate divisions rounded, and the *peduncles* arising from different points, the lowest two or three inches long, with large leaf-like *bracts*. Ultimate *pedicels* not more than a line and a half or two lines long. *Calyx* about a line deep, pale green; the *sepals* deltoid, not at all spotted. *Petals* lanceolate, pure white, three times as long as the calyx, spreading when the flower is fully expanded from two-thirds of the way down, so that the *corolla* measures about four lines across. *Stamens* equal, the outer row inserted very near the base of the petals, slightly pinkish, like the rose-pink long-beaked *carpels* just equalling the sepals. *Hypogynous scales* ligulate-spathulate, emarginate at the apex.

This handsome species, though it has been introduced many years, does not appear to have been anywhere described.—J. G. B.

A tall-growing *Sedum*, suitable for the open border or for rock-work. It is perfectly hardy, thriving in any good soil, and in its variegated form very ornamental, and producing a pleasing effect as a pot-plant.—W. W. S.



W.H. Fitch, del. et. lith.

J.N. Fitch imp.

Sedum cordifolium, Baker.

TAB. 34.

Natural Order CRASSULACEÆ.

Genus SEDUM, Linn.

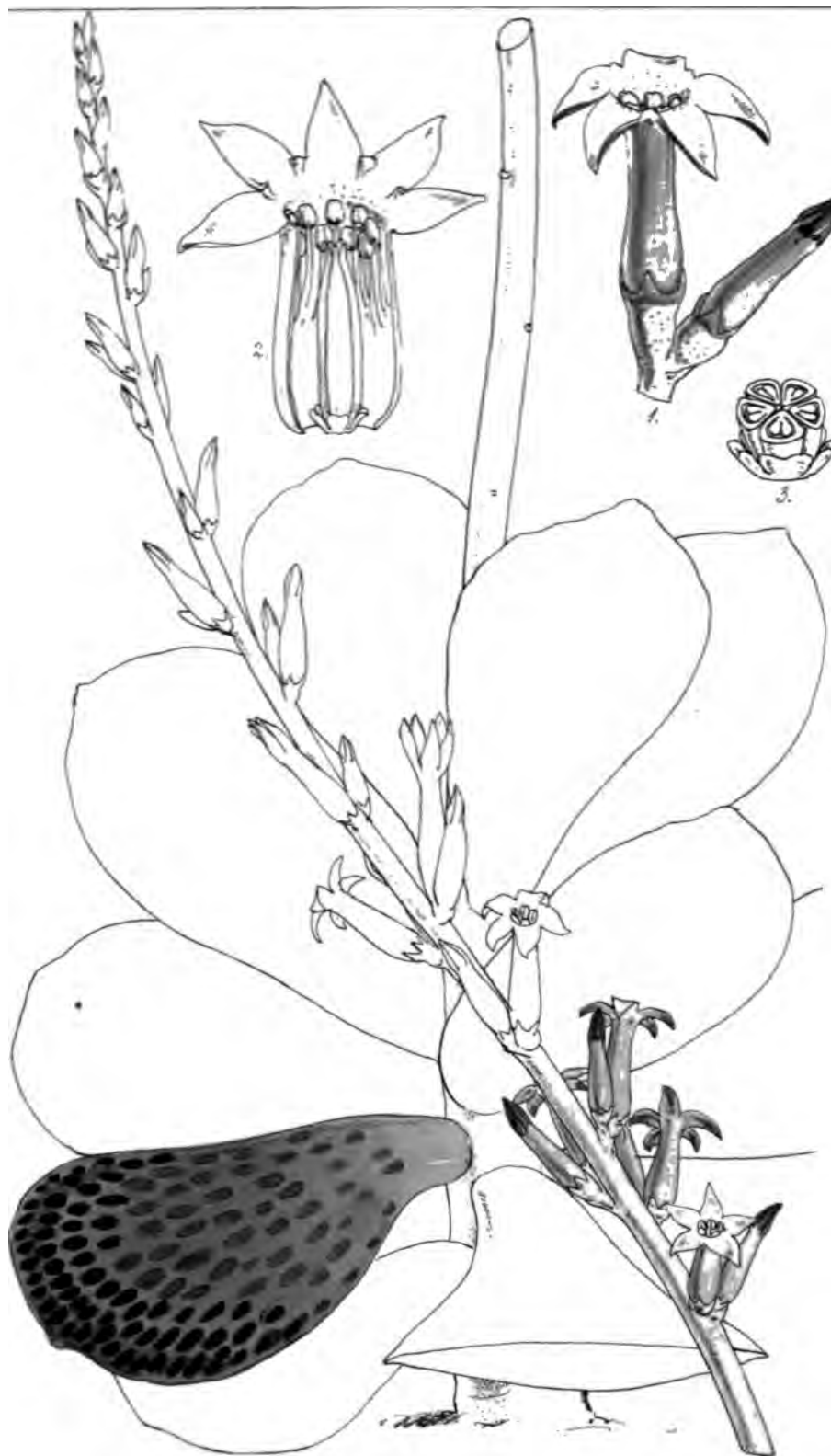
S. CORDIFOLIUM, *n. sp.* Foliis sparsis oblongis subpatulis obtusis denticulatis prasino-viridibus castaneo-tinctis basi late rotundato-cordatis, corymbis amplis densis ramis primariis alternis, pedicellis floribus multo brevioribus, sepalis lanceolato-deltoides pallide viridibus maculatis petalis triplo brevioribus, petalis albis paullulum roseo-tinctis lanceolatis patulis, staminibus petalis paulo longioribus, carpellis albis rostratis petalis æquantibus.

Native country not known.

Stems as long as in the two preceding, but not so thick and succulent, more or less deeply tinged with reddish brown. *Leaves* scattered, cordate-oblong, the lower ones spreading, the upper ones ascending and rather convex, the largest about three inches long by half as broad, the point bluntish, the edge denticulate, the base broadly cordate with rounded lobes which clasp the stem slightly, the colour a deeper green than in the other two and more or less tinged with reddish brown about the edge and centre. *Corymbs* four or five inches broad, the separate divisions nearly flat-topped, not arising nearly from the same point, and the outer ones falling considerably short of the central ones. Ultimate *pedicels* about two lines long, pale green. *Calyx* a line deep, the divisions lanceolate-deltoid, pale green spotted with reddish brown. *Petals* three times as long as the calyx, white with a slight reddish tinge, lanceolate, spreading from two-thirds of the way down when the flower is expanded, so that it is just the same size as that of the preceding. *Stamens* equal, slightly exceeding the petals, the inner row inserted near the base; the *anthers* tinged with pink. *Carpels* equalling the petals, pure white.

This also has been grown for some time in this country, but does not appear to be described. MM. Jordan and Fourreau have lately figured about twenty forms of this group of *Sedum* (which, following Haworth, they define as a genus under the name of *Anacampseros*), which, with the exception of *S. spectabile*, are from Central or Southern Europe, but this is not amongst them.—*J. G. B.*

Another tall-growing *Sedum*, useful as a border or rock-work plant, quite hardy, and growing freely in any good garden soil. Both this and *Sedum albo-roseum* are easily propagated by divisions of the root or by the leaves inserted in sand.—*W. W. S.*



W.H. Fitch, del. et. lith.

J.N. Fitch

Cotyledon maculata, *Salmodyck*.

TAB. 35.

Natural Order CRASSULACEÆ.

Genus COTYLEDON, Linn.

C. MACULATA (*Salm-dyck. Obs.* p. 5). Caulescens, foliis obovato-spathulatis ægre duplo longioribus quam latis, glauco-viridibus semper brunneo-maculatis, deorsum faciebus utrinque paullulum convexis, floribus simpliciter racemosis, solitariis vel deorsum geminatis breviter pedicellatis, calycibus corollis quadruplo brevioribus, segmentis lanceolatis roseis decurvatis tubo quadruplo brevioribus. — *D. C. Prodr.* vol. iii. p. 398, *C. hemisphærica*, *Harv. Fl. Cap.* ii. p. 376, *ex parte*.

A native of the Cape of Good Hope.

Caulescent; the *stem* often branched, four to six inches long, six to eight lines thick, below marked with the roundish scars of the fallen leaves, the old skin grayish. *Leaves* moderately close together in the upper part of the stem, ascending in various directions, obovate-spathulate, the largest two and a half to three inches long by an inch and a half broad, the colour a very glaucous-green, and both sides conspicuously spotted from the youngest stage with reddish brown, the edge horn-like, entire, with a very faint mucro at the apex, the lower part a quarter of an inch thick and both sides slightly convex, the upper half flat on the face. *Scape* fifteen to eighteen inches high including the flowering part, erect, terete, glaucous with a tinge of purple, without any leaves, and the raceme taking up its upper two-thirds. *Flowers* in a lax simple *raceme* a foot long, in the upper part solitary and near together, in the lower part slightly stalked, usually in pairs, with a space of about half an inch between them. *Calyx* between campanulate and tubular, about two lines deep, with lanceolate divisions reaching a third of the way down. *Corolla* quite tubular, about nine lines long, the tube green on the outside, the divisions lanceolate, reaching a quarter of the way down, rose-pink on both sides, finally rather decurved, the throat white, slightly spotted. *Stamens* in two sets, the longest just equalling the tube, the others very little shorter, and the *carpels* equalling the shorter *filaments*. *Hypogynous scales* broader than deep, the apex emarginate.—*J. G. B.*

This remarkable and interesting species of *Cotyledon* should be grown in a warm well-ventilated greenhouse, and requires but little water during the winter months. It should be potted in sandy loam and peat, with plenty of drainage. When the plant has attained a certain age it flowers pretty freely. It was sent to me from South Africa by Mr. Thos. Cooper.—*W. W. S.*



W.H. Fitch, del et lith.

J.N. Fitch, col.

Cotyledon rhombifolia, Haw.

TAB. 36.

Natural Order CRASSULACEÆ.

Genus COTYLEDON, Linn.

C. RHOMBIFOLIA (*Haworth, Phil. Mag.* 1825, July, No. 327, p. 33).

Caulescens, foliis late obovato-spathulatis sesqui longioribus quam latis, glauco-viridibus immaculatis vel maculis obscuris viridibus paucis præditis, facie superiore plano, inferiore paullulum convexo, racemis simplicibus vel furcatis, floribus solitariis vel deorsum geminatis sessilibus, calycibus corollis quintuplo brevioribus, corollæ segmentis deltoideis roseis patulis tubo quintuplo brevioribus. — *D.C. Prodr. loc. cit.* *C. hemisphærica*, *Harv. Fl. Cap.* ii. p. 376, *ex parte*.

A native of the Cape of Good Hope.

General habit of the preceding; the *stem* the same colour; the *leaves* the same kind of glaucous-green, with a horny edge, but not at all spotted or only very faintly so, when old, with a few blotches of darker green, broader upwards, the broadest part fully three-quarters of the distance from the base to the apex, the apex more broadly rounded, the base also broader, and the upper face in the lower part flat; the *raceme* often, but not invariably, branched; the *flowers* the same size and colour and arranged in the same way, but not at all stalked; the *calyx* shorter in proportion, and consequently more strictly campanulate; the *corolla-tube* thicker and less graceful; the *segments* shorter in proportion, rather deltoid than lanceolate, and not decurved.

This and the preceding may perhaps be two varieties of a single species, but assuredly they are radically different from *C. hemisphærica*, with which Dr. Harvey has combined them. Of the true *hemisphærica* a good figure will be found in DeCandolle's 'Plantes Grasses,' t. 87, so that we have not thought it worth while to reproduce it here. In this the leaves are barely an inch long, not at all spatulate, at least twice as thick as in our plants, consequently very much more convex on the back (whence the name), slightly convex on the face, in colour a pale apple-green, and marked with rows of distinctly visible minute papillæ, which these two do not exhibit.—*J. G. B.*

This species requires much the same soil and treatment as *C. maculata*, just described. Mr. Thos. Cooper found it in South Africa, and I received my plants from him.—*W. W. S.*



W. H. Fitch, del. et lith.

J. N. Fitch.

Solanum robustum, *Wen.* 57

TAB. 37.

Natural Order SOLANACEÆ.

Genus SOLANUM, *Linn.*

Sect. LEPTOSTEMUM. Antheris elongatis, apice attenuatis, poris terminalibus minutis retrorsis posticis vel sursum spectantibus.

Sub-sect. ACANTHOPHORA. Caule aculeato, aculeis acutissimis, rectis, rarius apice recurvis : cymis brevibus paucifloris ; corollis quinquepartitis.

S. ROBUSTUM (*Wendland, Flora*, 1844, p. 784). Ramis dense tomentoso-lanuginosis alatis aculeatis, aculeis compressis latissimis, foliis ovato-ellipticis pinnatifidis, supra viridibus velutinis, subtus ochraceo-ferrugineis tomentoso-lanuginosis, utrinque aculeatis, petiolis alatis et secundum caulem decurrentibus, floribus cymosis confertis, baccis globosis parvis ferrugineo-hirsutis. — *Sendt. in End. and Mart. Fl. Bras. fasc. vi. p. 72, t. 5, fig. 38—48 ; Dunal in D. C. Prodr. vol. xiii. part I. p. 257. S. alatum, Seemann and Schmidt, non Mærch.*

A native of the Province of Minas Geraes, in Brazil.

Shrubby, attaining a height of four or five feet, with copiously-branched woody main *stems*, the ultimate branches a quarter of an inch thick, densely ferrugineo-tomentose, winged to a breadth of one and a half line to two lines, densely armed with formidable prickles, which are woody in texture, very much compressed laterally, deltoid-cuspidate, slightly hooked towards the point, the largest half an inch long and as broad at the base. *Leaves* ovate-oblong, six or eight inches long by half as broad, pinnatifid half-way down to the midrib in the lower two-thirds with bluntish ovate-deltoid lobes, the base narrowed into the wings of the stem, texture herbaceous, the upper surface green and softly pubescent, the lower clothed with loose orange-ferruginous tomentum, the principal veins on both sides armed with sharp straight prickles. *Flowers* in close scorpioid *cymes* of about a dozen flowers each, on firm woody *peduncles* one or two inches long, which, like the short *pedicels* and calyx, are clothed with orange-ferruginous tomentum. *Calyx* eight or nine lines long, the teeth lanceolate, reaching more than half-way down. *Corolla-segments* ovate, white with a slight tinge of green, equalling the calyx ; the bright orange-yellow *stamens* two-thirds as long. *Ovary* subglobose, woolly ;

the *style* half as long as the stamens. *Berry* globoso-depressed, hairy like the calyx, about half an inch in diameter.—*J. G. B.*

A strong-growing species of *Solanum*, with large fine foliage and numerous ferruginous prickles. It delights in a very rich loamy soil, and requires protection during the winter, but in summer it may be bedded out, and then it is seen in perfection, if not too much exposed to the wind. It grows rapidly and produces a fine effect.—*W. W. S.*



W. H. Steudel et al.

J. N.

Tearyia aestuans, *Cava*

TAB. 38.

Natural Order URTICACEÆ.

Tribe URTICEÆ.

Genus FLEURYA, Gaudich.

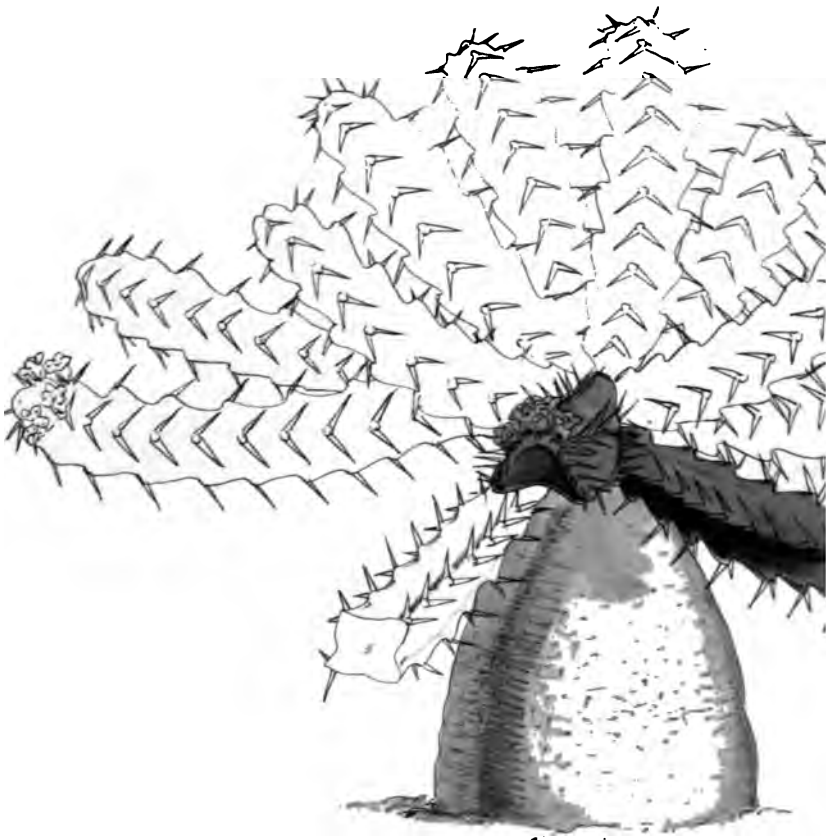
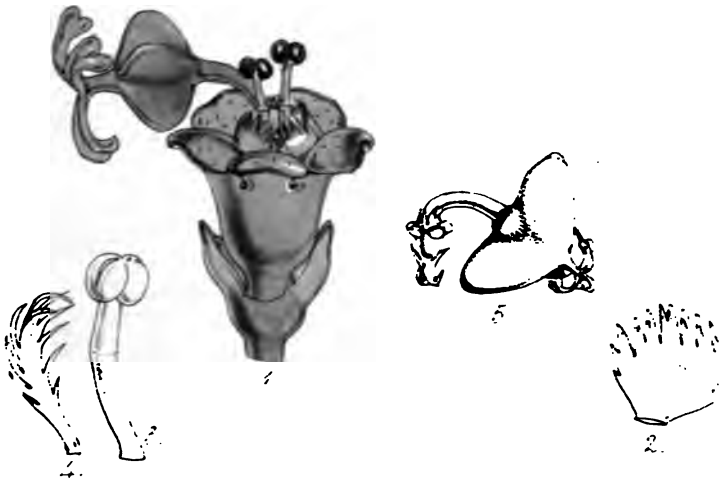
F. æSTUANS (Gaudich, *Voy. de l'Uran.* p. 196). Caulibus inter spinulos glabratis vel pubescentibus, foliis ovatis basi cordatis vel rotundatis, grosse inciso-serratis, paniculis valde compositis ramis omnium graduum thyrsoides, androgynis vel rarius unisexualibus, florum masculorum perianthiis æqualiter quadripartitis, foemineorum segmentis lateralibus valde auctis, pedunculis ultimis haud dilatatis, stigmatibus brevissimis uncinatis. — *Griseb. Flor. Brit. W. Ind.* p. 154. *Urtica æstuans*, Linn. *Sp. Plant.* p. 1397; Jacq. *Hort. Schæn.* vol. iii. t. 388. *F. æstuans* and *cordata*, Weddell. *Urtic.* p. 111—2.

A native of the tropical zone all round the world.

An annual nettle-like plant with slightly stinging hairs, copiously branched, and attaining a height of three or four feet when well-developed. *Stems* quite herbaceous and easily compressible, the main ones a quarter of an inch in thickness, usually not pubescent, but copiously clothed with spreading filiform bristly gland-tipped hairs, the longest an eighth of an inch long. *Stipules* membranous, bifid to the middle, the divisions filiform. *Petioles* weak, herbaceous, one to four inches long. *Leaves* ovate, five or six inches long when full-grown by three or four inches broad, the point acute, the edge all round with deltoid serrations to a depth of above a line, the base broadly rounded or slightly cordate, the veins prominent, texture quite membranaceous-papyraceous, the upper surface dark green, the lower much paler, both more or less furnished with bristly hairs like those of the stem. *Flowers* in thyrsoid subdeltoid *panicles* three to five inches long, on herbaceous erect *peduncles* one or two inches long from the axils of the leaves; all the branches of the panicle deltoid, with a naked space between them, the ultimate clusters crowded; pedicels exceeding the flowers; the male and female flowers different, but occurring in the same clusters. *Female calyx* with the two lateral divisions much larger than the other two; the *fruit* when developed deflexed, ovate in general outline but

unequal-sided, tipped at the end of the nearly straight upper edge by a short uncinat *style*; fully-developed fruit not more than half a line long and considerably exceeding the calyx. *Male perianth* with four or casually five ovate boat-shaped *segments* reaching down nearly to the base, the *stamens* equalling them in number and slightly exceeding them in length.—*J. G. B.*

This plant, although it has a nettle-like appearance, and stinging very unpleasantly when handled, produces very fine distinct foliage of a dark green colour, and is quite worth growing as a good contrast among other plants. It requires plenty of pot-room, and should be grown in strong turfy loam and peat. It was obtained from Trinidad, and first made its appearance by chance in earth imported with plants from that island.—*W. W. S.*



TAB. 39.

Natural Order EUPHORBIACEÆ.

Tribe EUPHORBIEÆ.

Genus EUPHORBIA, Linn.

Sect. DIACANTHIUM. Foliis sparsis vel obsoletis, floralibus oppositis, aculeis stipularibus, cymis axillaribus vel supra-axillaribus, glandulis exappendiculatis. Frutices gerontogei, carnosus, pulvinis elevatis tuberculati vel costati.

E. TETRAGONA (Haworth, *Phil. Mag.* 1826, p. 275). Fruticosa, tetragona, ramis facie planiusculis angulis obsolete dentatis, aculeis lignosis pungentibus deflexis geminatis, floribus in axillaris aculearum breviter pedunculatis, involucris parvis turbinato-campanulatis lobis rotundatis cuspidatis, foliis ad involucri basin ovatis squamiformibus, stylis brevibus liberis indivisis, capsulæ depressæ coccis sublignosis dorso rotundatis, seminibus globosis lævibus.—*Boiss. in D.C. Prodr.* vol. xv. part II. p. 84.

A native of the Cape of Good Hope.

Root oblong, attaining a couple of inches in thickness, almost woody in texture, with an irregularly-cracked pale brown skin. *Stems* radiating from its crown, eight to twelve in number, always simple, dark green, naked, leathery in texture, tetragonous, two to five inches long, about half an inch in thickness both ways, the four faces slightly concave. *Prickles* in pairs which are confluent at the base, hard, straight, woody, sharp, two or three lines long, deflexed and divergent, placed in rows about a quarter of an inch apart on the angles of the stem. *Flowers* from the axils of the spines, on short thick *peduncles*; the *leaves* existing only in the form of a pair of opposite ovate membranous scales at the base of the involucre. *Involucre* turbinate, about a line long, green, naked, coriaceous, the divisions roundish with a point, the scales of the throat roundish and fimbriated, membranous with red tips. *Male flowers* numerous, the longest exserted, the *anthers* crimson; *females* solitary, long-stalked, much exserted, cernuous, the *style* short, thick and undivided. *Capsule* depresso-globose, the cocci almost woody, rounded at the back, an eighth of an inch deep; the *seeds* smooth and globose.—*J. G. B.*

This remarkable dwarf spiny species of *Euphorbia* was sent from South Africa, where it was obtained by Mr. Thos. Cooper. It requires the temperature of a warm greenhouse, and should be kept close to the light and moderately watered during the winter months. A light sandy loam with plenty of drainage seems to suit it best.—*W. W. S.*



W.H. Fitch, del. et lith.

J.N. Fitch

Peperomia magnoliaefolia, Dietr.

TAB. 40.

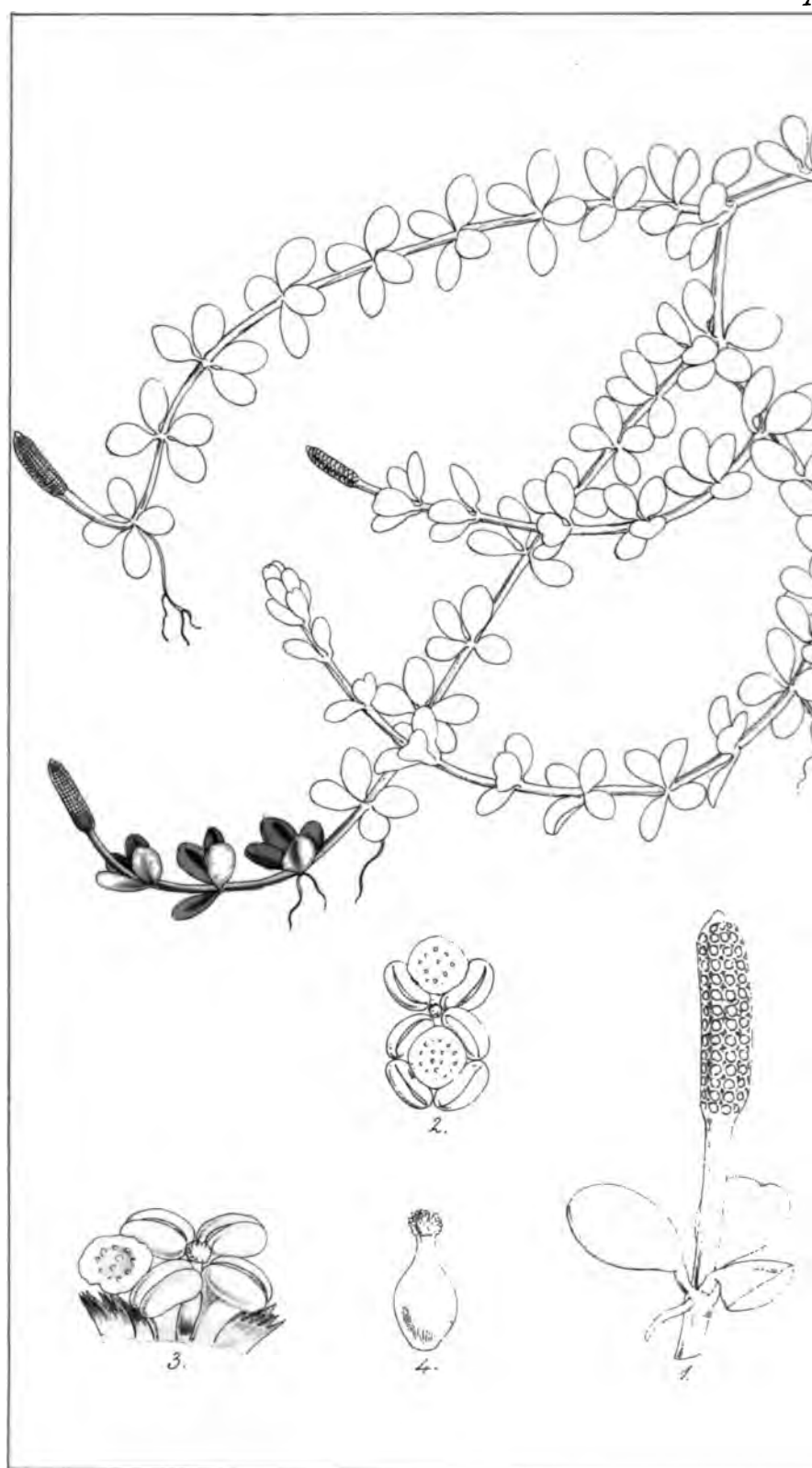
Natural Order PIPERACEÆ.
Genus PEPEROMIA, Ruiz & Pavon.

P. MAGNOLIÆFOLIA (*A. Distr. Sp.* tom. i.) Caulibus ramosis robustis ascendentibus glabris, foliis sparsis alternis magnis crassis obovatis obtusis glabris, deorsum in petiolum crassum profunde canaliculatum attenuatis, nervo medio crasso, venis lateralibus primariis 4—5, amentis ex axillis foliorum pedunculatis magnis, floribus confertis, ovariis ovatis apice stigmatiferis, baccis immersis rostellatis. — *Miquel, Syst. Peper.* p. 97. *Piper magnoliæfolium*, *Jacq. Ic.* t. 213.

A native of the West Indies.

Stems almost woody at the base, considerably branched, procumbent or ascending, the principal branches four to six lines thick, roundish, succulent in texture, quite naked, green, more or less tinged with red. *Leaves* solitary, alternate, ascending, obovate, five or six inches long when well-developed by two and a half to three inches broad two-thirds of the way up, the point blunt, the lower half narrowed gradually into a short thick deeply channelled semiterete succulent *petiole*, the texture of the leaf unusually thick and succulent but firm, both surfaces quite naked, the upper one a dark shining green, the lower paler, the midrib and four or five oblique veins on each side conspicuous. *Spikes* six or seven inches long, not more than two lines thick when in flower, on succulent *peduncles* coloured like the stems, two or three inches long from the axils of the leaves. *Flowers* very minute, in close whorls round the spikes of about eight flowers each. *Bracts* short-stalked, fleshy, glabrous, roundish. *Anthers* oblong, bright yellow, dehiscing longitudinally down the centre, slightly exceeding the ovate *ovary*. *Berry* ovate, brown, immersed, patent, half a line long.—*J. G. B.*

This fine species of *Peperomia* I obtained from Belize. It should be grown in a moist stove, potted in a mixture of turfy peat and Sphagnum. It is a free-flowering plant, and its fine glossy leaves have a very pleasing effect.—*W. W. S.*



W. H. Fitch, del. et. lith.

J. N. Fitch

Peperomia microphylla, H. B. K.

TAB. 41.

Natural Order PIPERACEÆ.

Genus PEPEROMIA, Ruiz & Pavon.

P. MICROPHYLLA (*H. B. K. Nov. Gen.* vol. i. p. 69, tab. 15, fig. 2).

Caulibus debilibus ramosis subtetragonis ascendentibus, foliis verticillatis quaternis parvis obovato-oblongis breviter petiolatis, uninerviis, pilosiusculis, pellucido-punctatis, amentis parvis terminalibus pedunculatis, floribus confertis, ovariis urceolatis apice stigmatiferis stylo conspicuo.—*Miquel, Syst. Piper.* p. 167.

A native of the Columbian Andes and Mexico.

Stems succulent, slender, trailing, branched, leafless in the lower part. *Branches* ascending, four to six inches long, not more than half a line in thickness, green tinged with red, a little pubescent, subquadrangular, with succulent adventitious *rootlets* from the *nodes*, which are slightly swollen, and four to six lines apart. *Leaves* in whorls usually of four, casually of five leaves each, obovate-oblong, three or four lines long by about half as broad, the point blunt, the lower half narrowed gradually into a short distinct *petiole*, the texture succulent, colour a pale green, the upper surface convex and the edge deflexed, only the midrib visible, both sides conspicuously pellucido-punctate, minutely and deciduously hairy, and the edge, especially in the upper part, minutely ciliated. *Spikes* about half an inch long and an eighth of an inch in thickness, on *peduncles* of about their own length from the summit of the branches. *Flowers* minute, crowded, about eight in a whorl. *Bracts* round-peltate, equalling the oblong *stamens*. *Ovary* flask-shaped, with an entirely terminal penicillate *stigma* and a conspicuous *style*.—*J. G. B.*

A neat dwarf trailing *Peperomia*, growing freely in a damp stove. I received it from Mexico, clinging to an orchid which had evidently been obtained from the branch of a tree. It thrives in a mixture of turfy loam and Sphagnum.—*W. W. S.*



W. H. Fitch, del. et lith.

J. N. Fitch, imp.

Tritoleia aurea, Lindl.

TAB. 42.

Natural Order LILIACEÆ.

Tribe SCILLEÆ.

Genus TRITELEIA, Hook.

T. AUREA (*Lindl. Bot. Reg.* 1841, p. 78). Foliis lincari-filiformibus erectis scapo æquantibus, floribus 4—6 umbellatis, spathis membranaceis bivalvis divisionibus lanceolatis pedicellis triplo vel quadruplo brevioribus, perigoniiis aureis fere ad basin 6-partitis segmentis æqualibus oblongo-lanceolatis patulis, staminibus æqualibus flore multo brevioribus, stylo ovario oblongo trisulcato æquali.—*Kunth, Monoc.* vol. iv. p. 469.

A native of Monte Video and Buenos Ayres.

Bulb round, four to six lines thick, with loose membranous outer coats. *Leaves* several from a root, contemporaneous with the flowers, erect, three or four inches long, under a line in breadth, pale green, quite naked, linear-filiform, convex on the back, the midrib forming a slight keel, the face deeply channelled. *Scapes* one to three from a root, about equalling the leaves, erect, slender, naked. *Spathe* white, membranous, four to six lines deep, cleft half or two-thirds of the way down into two ovate-lanceolate valves. *Flowers* three to six in an *umbel*, on slender erect naked *pedicels* which are ultimately an inch and a half or two inches long. *Perianth* bright yellow, pale green at the base outside, half an inch deep, six-parted nearly to the base, the divisions oblong-lanceolate, naked, a line and a half or two lines broad, spreading considerably when the flower is expanded. *Stamens* six, equal, arising from nearly the base of the perianth and falling considerably short of it. *Ovary* oblong, deeply three-grooved, with an erect *style* about its own length, which equals the stamen; the papillose *stigma* deeply trisulcate.—*J. G. B.*

This pretty free-flowering bulb I obtained from one of the Continental nurseries. I find it succeeds well in sandy loam and peat, requiring only the protection of a cold frame in the winter, with but little water when at rest. It flowers in the early spring months.—*W. W. S.*



W.H. Fitch, del. et. lith.

Tritelia conspicua, Baker.

TAB. 43.

Natural Order **LILIACEÆ.**

Tribe **SCILLEÆ.**

Genus **TRITELEIA, Lindl.**

T. CONSPICUA, n. sp. Foliis linearibus planis flaccidis scapo unifloro subæquantibus, spathis membranaceis profunde bivalvatis divisionibus lanceolatis pedicellis triplo brevioribus, perigonii segmentis oblongo-ellipticis albis violaceo-costatis subæqualibus valde imbricatis tubo infundibuliformi longioribus, staminibus inæqualibus, longioribus tubo æquantibus, stylo ovario obovato-oblongo longiore.

Native country not clearly known.

Bulb oblong, half an inch thick, with loose white membranous outer coats and numerous bulblets and thick white fleshy rootlets. *Leaves* all radical, contemporaneous with the flowers, linear, nine or ten inches long, three to three and a half lines broad, flaccid in texture, a rather pale green, quite naked, with a distinct keel and a very faint glaucous bloom on the under side. *Scape* erect, terete, pale green, slender, equalling the leaves. *Spathe* quite membranous, white with a faint tinge of green or violet, twelve to fifteen lines deep, two-cleft about half-way down, the divisions lanceolate. *Peduncle* slightly drooping, about three inches long from the base of the spathe. *Flowers* always solitary, the tube infundibuliform, half to five-eighths of an inch deep, with the purplish green keels of the segments continuous to its base. *Segments* nearly equal, spreading horizontally when the flower is fully expanded, oblong, rounded at the apex with a slight often quite cuspidate point, three-quarters of an inch deep, five lines broad, pure white with a distinct keel of purplish green on the outside. *Stamens* in two sets of three each, the *anthers* of the longest just attaining the throat of the flower, the top of those of the shorter set just reaching the base of the others. *Ovary* obovate-oblong, rather shorter than the erect *style*, which equals the shorter stamens; the papillose *stigma* densely trisulcate.

Comes very near *T. uniflora*, Lindley, good figures of which will be found in Bot. Mag. 3327, and Bot. Reg. 1921, and with the same alliaceous scent, but a more showy plant, with broader, paler and more flaccid leaves, a longer peduncle, considerably larger and less deeply-colour flowers, with the segments not narrowly oblong-lanceolate, narrowed from just above half-way up to

an acute point, but as broad a short distance from the point as at the middle, and consequently considerably more imbricated.—*J. G. B.*

This species of *Triteleia* I obtained from one of the nurseries in Belgium, under the name of *T. uniflora*, a name it generally bears in collections. It is a very useful plant for conservatory decoration during the spring months, producing its fine white flowers very freely. It should be grown in a cool frame during winter, and brought into a warmer temperature as the flower-buds appear. If planted under a warm south wall it will stand the winter. Rich sandy loam and leaf-mould seems to be the soil best suited for the plant.—*W. W. S.*



W.H.Fitch, del. et. lith.

J. N. Fitch

Albuca fastigiata, Dry.

TAB. 44.

Natural Order LILIACEÆ.

Tribe SCILLEÆ.

Genus ALBUCA, Linn.

- A. FASTIGIATA (*Dryand. in Act. Holm.* 1784, p. 296). Foliis linearibus scapo excedentibus, floribus numerosis late thyrsoides, pedicellis inferioribus longissimis, superioribus brevibus, omnibus erecto-patentibus, perigonii segmentis albis plus minus cucullatis et viridicarinatis, interioribus coherentibus, stylo obtuse trigono ovario paulo longiore. — *Thunb. Prodr.* p. 65; *Ejus. Fl. Cap.* p. 331; *Willd. Sp. Plant.* ii. p. 101; *Andrews, Bot. Rep.* t. 450; *Red. Lil.* t. 474; *Bot. Reg.* t. 277; *Roem. and Schult.* vii. p. 498; *Kunth,* iv. p. 375.

A native of the Cape of Good Hope.

Bulb two or three inches thick, crowned with the brown fibrous upper free part of its outer coats, producing only a single *stem*. *Leaves* twelve to eighteen inches long, linear-lanceolate, about three-quarters of an inch broad in the lower part, flaccid, recurved, glabrous, bright green, the edge slightly ciliated, clasping the stem at the base but not dilated. *Scape* about a foot high, naked, firm, subterete. *Flowers* in an ample broad many-flowered subdeltoid thyrsoid *raceme* twelve to eighteen inches long and sometimes a foot broad in the lower part; the *peduncles* green, naked, erecto-patent, nearly straight or slightly curved upwards, the lower ones reaching a length of four to six inches, the upper ones growing gradually shorter, till at last the uppermost flowers are nearly sessile. *Bracts* lanceolate-acuminate, about an inch long, membranous with a more or less herbaceous centre. *Perianth* about an inch deep; the *segments* ligulate-oblong with a green keel on the outside, the rest pure white, all more or less hooded at the point, the outer three loose and curving round as the flower grows, the three inner ones cohering permanently, broader in the lower part than the outer ones and the hood crested with a yellow tubercle. *Ovary* and *style* deeply three-grooved, the latter a little the longest in the flower and hairy upwards. *Stamens* all fertile.—*J. G. B.*

A tall-growing species of *Albuca*, of easy cultivation in a cool greenhouse or frame. It requires rich sandy loam, with plenty of pot-room. I received the plant from South Africa, where it was collected by Mr. Thos. Cooper.—*W. W. S.*



W.H. Fitch, del. et lith.

J.N. Fitch, sc.

Albuca caudata, Jacq

TAB. 45.

Natural Order LILIACEÆ.

Tribe SCILLEÆ.

Genus ALBUCA, Linn.

- A. CAUDATA (*Jacq. Coll.* iv. p. 203). Foliis linearibus scapo duplo brevioribus, floribus paucis laxis late thyrsoideis, pedicellis longissimis erecto-patentibus vel patentibus, perigonii segmentis albis plus minus cucullatis et viridi-carinatis, interioribus coherentibus, stylo triquetro trisulcato ovario paulo longiore.—*Jacq. Icon.* vol. ii. p. 20, t. 442; *Willd. Sp. Plant.* vol. ii. p. 102; *Kunth, Monocot.* vol. iv. p. 375.

A native of the Cape of Good Hope.

Bulb two or three inches thick, round or oblong, crowned as in the preceding with brown fibres. *Leaves* about a foot long, four lines broad, more rigid than in the preceding, clasping the stem at the base and more or less concave on the face upwards, and keeled on the back. *Scape* two feet including the flowering part, erect, firm, terete, naked, the same colour as the leaves. *Flowers* eight to fifteen in number, arranged in a broad thyrsoid raceme; the *bracts* quite similar to those of the preceding; the lower *pedicels* three or four inches long, spreading from the axis at right angles or somewhat ascending, the upper ones erecto-patent and about two inches long. *Segments* of the *perianth* the same colour and shape and arranged in the same way as in the preceding. *Stamens* all fertile; the *anthers* yellow; the inner *filaments* more flattened upwards than the outer ones. *Style* triquetrous, deeply three-grooved, exceeding the oblong *ovary*.

Allied to *A. fastigiata*, from which it may be readily distinguished by the different leaves and racemes.—*J. G. B.*

This *Albuca* was also sent to me from South Africa by Mr. Thos. Cooper. It is not quite so free to grow flower as *Albuca fastigiata* when treated in a similar manner.—*W. W. S.*



W H.Fitch, del et.lith.

J.N.Fitch

Phædranassa Carmioli, Baker.

TAB. 46.

Natural Order AMARYLLIDACEÆ.

Genus PHÆDRANASSA, *Herb.*

- P. CARMIOI, *n. sp.* Foliis lanceolatis erectis scapo subæquantibus sursum angustatis deorsum ad petiolum longe attenuatis, umbellis 6—8 floris, pedunculis perianthio subduplo brevioribus, floribus bipollicaribus, germine oblongo viridi apice constricto, tubo subcylindræo rubro, segmentis lanceolato-deltoidæis viridibus margine pallidioribus tubo subquadraplo brevioribus.

A native of Costa Rica, discovered and sent by M. Carmiol.

Bulb two to three inches in thickness, roundish, tunicated, narrowed suddenly at the neck, with membranous brown outer coats. *Scape* above two feet high, quite straight, terete, pale glaucous-green with a deciduous bloom. *Leaf* erect, including the petiole about as long as the scape, lanceolate, rather over three inches broad, narrowed gradually to an acute point and below very gradually into a *petiole* three or four inches long which is nearly or quite as thick as the stem, the texture firm but not very thick, the upper surface a very bright grass-green, the lower covered with a dense glaucous bloom like that of the stem, the midrib channelled on the upper surface and very prominent below, the veins clearly visible, about twenty on each side of the midrib. *Flowers* six to eight in a cernuous *umbel*, contemporaneous with the leaves; the *spathe* in four or six linear divisions about equalling the *pedicels*, which are ultimately an inch long. *Perianth* rather over two inches long, the germen a quarter of an inch long, oblong, green, constricted at the apex, the tube fifteen to eighteen inches long, cylindrical, slightly dilated upwards, bright red, the divisions lanceolate-deltoid, about four lines deep, scarcely spreading, green with a paler edge. *Stamens* subequal, exserted to a length of three or four lines, inserted in the tube about the same distance above the ovary. *Style* rather shorter than the stamens. *Ovary* bluntly trigonous, the *ovules* in two long rows in each of the cells.—J. G. B.

This interesting bulb I received last year from Mons. Jules Carmiol, of Costa Rica. It makes one or two large handsome leaves, during the season of growth, which are covered with dense white bloom on the under side. It seems to flower freely, and should be grown in a damp stove.—W. W. S.



W.H. Fitch, del. et. lith.

J.N.F.

Myrsiphyllum falcatum, Kunth.

TAB. 47.

Natural Order LILIACEÆ.

Tribe ASPARAGEÆ.

Genus MYRSIPHYLLUM, Willd.

M. FALCIFORME (*Kunth, Monocot. v. p. 107*). Caulibus volubilibus, ramis ramulisque divaricatis glabris angulatis, cladodiis sessilibus ovato-oblongis vel oblongis utrinque attenuatis, pedunculis solitariis axillaribus floribus duplo vel triplo longioribus.

A native of the Cape of Good Hope.

Climbing indefinitely and copiously branched; the *stems* slender, firm, bright green, spreading at right angles or nearly so, angular, quite naked. *Leaves* (stipule-like) minute, scariose, lanceolate-acuminate. *Cladodia* (leaf-like) ovate or oblong, quite sessile, nine to eighteen lines long, five or six lines broad, narrowed to both ends from the middle or a little rounded at the base, firm in texture and often falcately curved, bright green, quite naked, conspicuously parallel-veined, the edges thickened and a little rough. *Peduncles* solitary or very rarely geminate, four or five lines long, from the axils of the leaves, very slender, cernuous. *Perianth* a quarter of an inch deep, with a distinct neck, the divisions equal, ligulate-oblong, white with a green keel, reaching three-quarters of the way down, recurved when the flower expands. *Stamens* six, equal, slightly shorter than the flower, inserted near its base. *Ovary* sessile, oblong, naked, slightly exceeding the erect *style*. *Fruit* a globose naked three-celled finally black *berry* a quarter of an inch in diameter.—*J. G. B.*

Mr. Thos. Cooper sent me this elegant climbing plant from South Africa. I have grown it several years; and when in full vigour, and its small whitish flowers, which are produced profusely, show among the bright green foliage, it is a most charming object. It grows very freely, making an annual shoot of many feet, and climbing beautifully up a cord or among slender branches. It thrives in a mixture of turfy loam and leaf-mould, requiring plenty of water while growing.—*W. W. S.*



W.H. Fitch, del. et. lith.

J. N. Fitch, m.

Tradescantia discolor Sm. var. *concolor* Baker.

TAB. 48.

Natural Order COMMELYNACEÆ.

Genus TRADESCANTIA, Linn.

T. DISCOLOR Smith, *Ic. Inedit.* t. 10. *Willd. Sp. Plant.* vol. ii. p. 18; *Ker.* in *Bot. Mag.* t. 1192, and *Hook. Bot. Mag.* 5079 (a variegated variety); *Red. Lil.* t. 168.

Var. concolor. Foliis utrinque concoloribus.

Leaves about a foot long, fifteen lines broad in the lower part, arising from a short thick erect *stem*, dilated and clasping it at the base, erect, firm, subrigid in texture, convex on the back in the lower part and concave on the face, narrowed gradually from above the middle to an acute point, prominently parallel-veined, the edge purple, both sides in this variety a uniform pale green. *Flowers* on short stout ascending axillary *peduncles*, in *umbels* which scarcely emerge from the large two-valved *spathes*. *Pedicels* stout, pale green, naked. *Sepals* firmer and slightly shorter than the petals, ovate and not quite equal. *Petals* pure white tinged at the tip with pink, as broad as deep, broadly pointed, connected at the base; the expanded flower eight or nine lines broad. *Stamens* six, hypogynous, subequal; the *filaments* curiously bearded at the middle with moniliform hairs; the *anthers* narrow, pinkish, the broad connective yellow and obversely deltoid. *Ovary* white, small, sessile, roundish, naked, three-celled, with only a single *ovule* in each cell; the *style* slender, erect, twice as long as the ovary. *Capsule* purplish, fleshy, obliquely obovate, three- or by abortion two-celled, the dehiscence loculicidal.—*J. G. B.*

I received this plant from Belize a few years since, sent with a collection of orchids. It grows and flowers freely in a damp stove, potted in a mixture of loam and peat.—*W. W. S.*



W. H. Fitch, del et. lith.

J. N. Fitch

Cotoneaster microphylla, Wall.

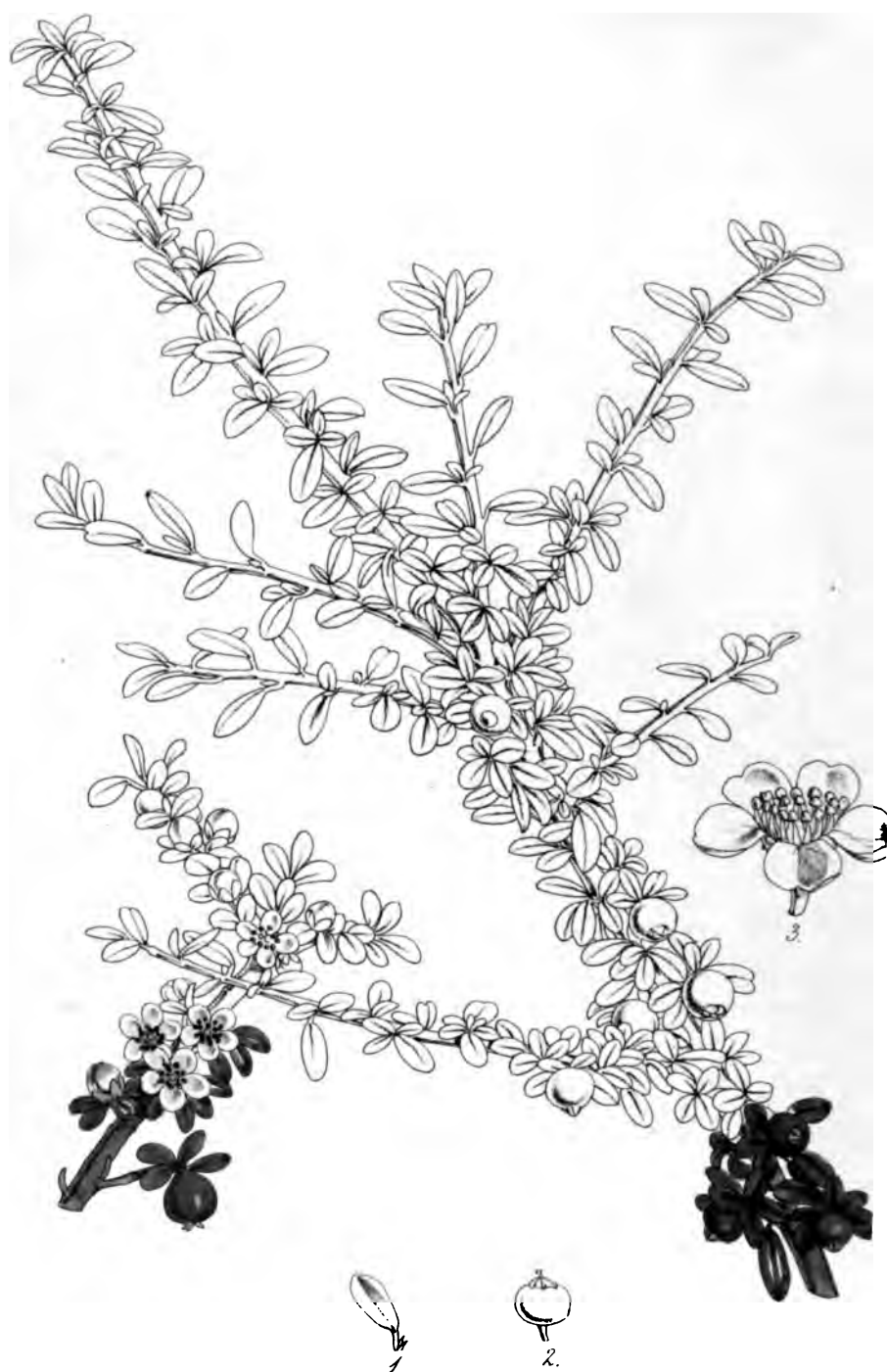
TAB. 49.

C. MICROPHYLLA (*Wall. Cat.* No. 662). Frutex humilis ramis strictis brevibus patentibus, foliis parvis oblongo-obovatis, duplo longioribus quam latis, apice rotundatis, emarginatis vel mucronatis, basi subcuneatis, supra nitide saturate viridibus, infra pallidis glaucescentibus, tenuiter albo-sericeis, fructibus coccineis, depresso-globosis. —*Lindl. Bot. Reg.* t. 1114.

The wild specimens of this form we have seen are from Bhotan, 7500—10,000 feet, *Griffith*; Cashmere, 8000 feet, *Falconer*; Simla, 8—10,000 feet, *Dr. Thomson*; Sikkim, 9—14,000 feet, *Dr. Hooker*; Kumaon, 7000 feet, *Strachey and Winterbottom*.

Bush three to four feet high in a good situation; the branches short, stiff, crowded and spreading. *Leaves* obovate-oblong, three-eighths of an inch long by about half as broad when fully mature, a shining dark green and quite naked above, flat, and often with the edge a little decurved and the slight mucro bent down, or the apex sometimes emarginate, the under side glaucous and permanently thinly silky, the base subcuneate or a little rounded. Fully-expanded *flower* three-eighths of an inch across. *Berry* depresso-globose, crimson, not shining, a quarter of an inch deep by rather more broad.—*J. G. B.*

This now very common evergreen undershrub has a drooping and very graceful habit of growth, and seems to be quite hardy. It is valuable for planting on steep banks and rock-work, where it produces a very pleasing effect at all times, but particularly late in the autumn, when it is covered with small red berries, a beautiful contrast to its small glossy green leaves. It will grow well, trained against a wall, and will mount, with good management, to a height of ten or twelve feet. In this situation it is often attacked by a small brown scale-insect, which does the plant much injury, causing the leaves to turn yellow and drop off, and eventually the plant dies of exhaustion, without the scale be removed. The plant seems to thrive in almost any soil, and is freely increased by cuttings, layers and seeds.—*W. W. S.*



W.H. Fitch, del et lith.

J.N. Fitch

Cotoneaster thymæfolia, Hort.

TAB. 50.

C. THYMÆFOLIA (*Hort.*) Frutex humilis, ramis strictis brevibus congestis, sæpe decurvatis, foliis perparvis, oblongo-obovatis, duplo longioribus quam latis, apice rotundatis ægre mucronatis, basi paululum rotundatis, supra nitide saturate viridibus, infra pallidis glaucescentibus, tenuiter albo-sericeis, fructibus perparvis, coccineis, depresso-globosis.

Collected by Dr. Thomson at Simla, at 10,000 feet; and by Dr. Royle in the North-western Himalayas.

A *bush* under a foot high, with congested crowded often decurved *branches*. *Leaves* obovate-oblong, under a quarter of an inch long by an eighth of an inch broad, a bright shining dark green and naked above, flattish, with the edges and very faint mucro often slightly decurved or the apex slightly emarginate, the lower half a little rounded to the base, the lower side glaucous and permanently thinly white-silky. Expanded *flower* not more than a quarter of an inch across. *Berry* depresso-globose, crimson, not shining, two lines deep by an eighth of an inch broad.

This form is, so far as we know, unpublished, but it is grown not uncommonly in gardens under the above name. It is exceedingly like *microphylla* in the shape and clothing of the leaves and shape and colour of the berry, but all upon a smaller scale.—*J. G. B.*

A very pretty neat little evergreen undershrub, having very small leaves and purplish red berries. It is quite hardy, likes a light rich garden soil, and is readily increased by cuttings, layers or seeds. My plants were raised from seed kindly furnished me by the late Dr. Royle, who procured them from Northern India.—*W. W. S.*



W.H. Fitch, del. et. lith.

J.N. Fitch, imp.

Cotoneaster congesta, Baker.

TAB. 51.

C. CONGESTA (*Baker*). Frutex humilis, ramis strictis brevibus congestis decurvatis, foliis parvis oblongo-obovatis duplo longioribus quam latis, apice rotundatis inconspicue mucronatis vel emarginatis, basi paululum rotundatis, supra modice nitide gramineo-viridibus, infra pallidioribus, demum calvatis, fructibus coccineis, depresso-globosis.

Sent by Dr. Royle to Mr. Saunders, from the Western Himalayas.

A bush under a foot high, with rigid decurved remarkably congested branches, which are thinly silky only when very young. Petioles more slender and rather longer than in *microphylla*, and not nearly so silky. Leaves obovate-oblong, measuring about five lines long by half as broad when fully developed, nearly flat, the apex broadly rounded and inconspicuously mucronate or emarginate, the lower half slightly rounded towards the base, the upper surface a much paler green than in any of the others, the lower surface only very thinly glaucous-silky in the young state, and soon growing quite glabrous. Expanded flower about four lines across. Berry depresso-globose, crimson, not shining, over a quarter of an inch broad by a quarter of an inch deep.

Berry and leaves the same size and shape as those of *C. microphylla*, but the growth of the plant remarkably congested, with the main branches decurved, the leaves much paler than in any of the other forms, and soon becoming naked below.—*J. G. B.*

This little hardy evergreen shrub forms a compact rounded mass of branches and foliage, and thrives well on sunny rock-work or a steep dry bank with a southern aspect. It is of slow growth, and with me scarcely attains a foot in height. It is easily propagated by cuttings and seeds. I raised this species from seeds which came from the North of India, and were kindly presented to me by the late Dr. Royle.—*W. IV. S.*



W. H. Fitch, del et hth.

J. N. Fitch

Cotoneaster buxifolia, Wall.

TAB. 52.

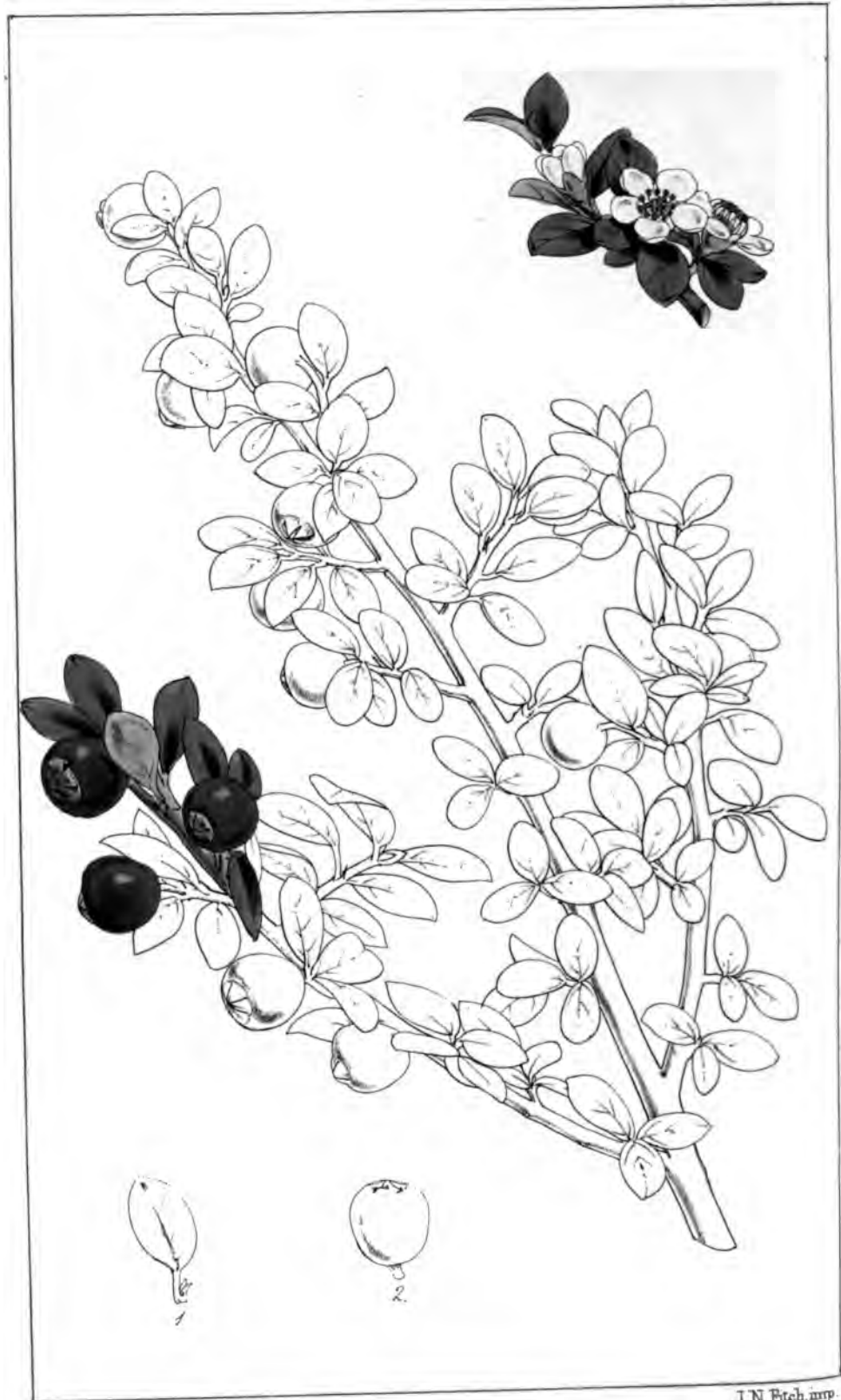
C. BUXIFOLIA (*Wall. Cat.* 661). Frutex medioeris vel altus, ramis elongatis vel erecto-patentibus, foliis oblongis vel paullulum obovatis duplo longioribus quam latis e medio utrinque rotundato-attenuatis, apice mucronatis, supra saturate viridibus, infra glaucescentibus, conspicue albo-sericeis, margine ciliatis, fructibus coccineis, depresso-globosis.—*Wight. Ic.* t. 992. *C. marginata*, *Hort.*

A native of the temperate region both of the Neilgherries and Himalayas.

A bush attaining sometimes a height of six or eight feet, with elongated, not crowded, usually ascending branches. Leaves oblong or slightly obovate, measuring three-quarters of an inch long by three-eighths or rather more broad when fully developed, distinctly mucronate, slightly rounded, especially upwards, from the middle to both ends, the apex subdeltoid, the upper surface a duller green than in *microphylla*, the lower decidedly glaucous and permanently white-silky, with the edge more distinctly ciliated than in either of the other forms, from which it is often called *marginata* in gardens. Flowers over three-eighths of an inch across when fully expanded. Berry dull crimson, depresso-globose, a quarter of an inch deep by rather over a quarter of an inch broad.

A larger laxer bush than *microphylla*, with duller leaves, twice the length and breadth of those of that form when fully developed, and much more oblong in shape; the berry similar in size and shape, but a duller crimson.—*J. G. B.*

This evergreen species grows freely in any good garden soil, and is quite hardy. It is well suited for covering walls, and when properly managed produces a very pleasing effect, from the abundance of its box-shaped shining leaves and crimson berries. Like most of the other species of this section of *Cotoneaster*, it is freely increased by cuttings, layers or seeds. This is another species which I raised from seed furnished to me by the late Dr. Royle. The seeds were from the North of India.—*W. W. S.*



W. H. Fitch, del. et. lith.

J. N. Fitch, imp.

Cotoneaster prostrata, Baker.

TAB. 53.

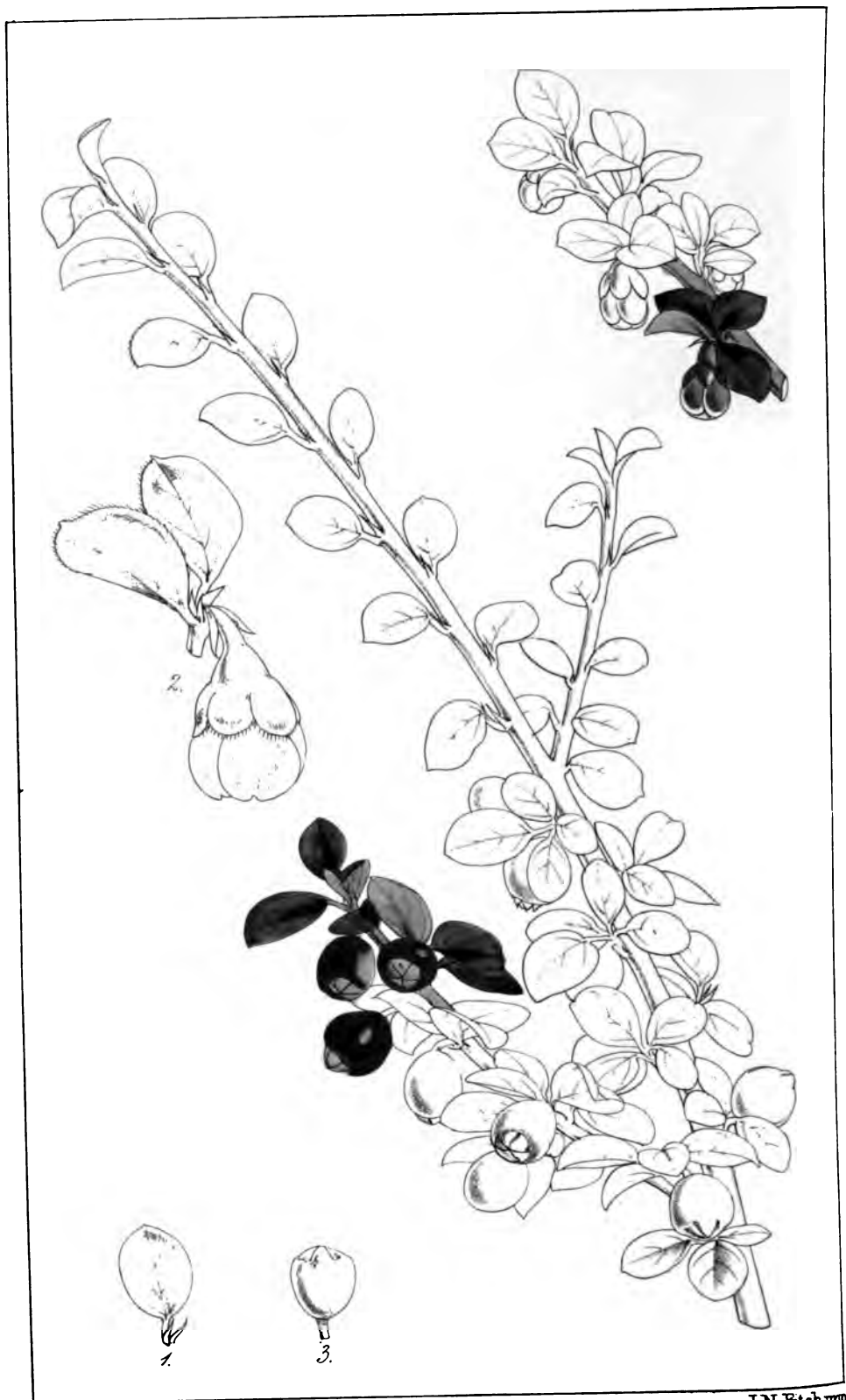
C. PROSTRATA (*Baker*). Frutex ramis elongatis omnino prostratis, foliis oblongo vel obovato-rotundatis sesqui longioribus quam latis, mucronatis, utrinque rotundato-attenuatis, supra saturate viridibus, infra tenuiter albo-sericeis, fructibus coccineis, depresso-globosis.

Sent to Mr. Saunders by Dr. Royle, from the Western Himalayas.

An entirely prostrate *bush*, with elongated *branches* and longer nodes than in any of the other forms. *Leaves* rotundato-oblong or rotundato-obovate, six or seven lines long by four lines broad when fully developed, mucronate, rounded to both ends from the middle or a little above it, the upper surface dark green, the lower slightly glaucous and thinly white-silky. *Flower* over three-eighths of an inch across when fully expanded. *Berry* rather brighter than in *buxifolia*, globose or with a slight turbinate tendency, measuring three-eighths of an inch each way.

Intermediate in the leaves and drupe between *buxifolia* and *rotundifolia*, and differing from both by its entirely prostrate habit.—*J. G. B.*

With me, planted on a bank facing the south, this species has a prostrate straggling habit, growing freely, with largish berries and leaves, both of which are sparingly produced. It is quite hardy, but drops many of its leaves in the autumn. Any good garden soil seems to suit the plant, which may be easily increased by layers, cuttings or seeds. It is the least effective as a decorative plant of any of the section of *Cotoneaster* now under consideration. I obtained seeds of this species from the same source as most of the preceding species, viz., the late Dr. Royle, and they were from Northern India.—*W. W. S.*



W.H. Fitch, del. et lith.

J.N. Fitch imp.

Cotoneaster rotundifolia, Wall.

TAB. 54.

C. ROTUNDIFOLIA (Wall. Cat. No. 663). Frutex humilis, ramis strictis patentibus sæpe elongatis, foliis rotundatis vel rotundato-obovatis, subæquilongis et latis, sæpe horizontaliter distichis, distincte mucronatis, utrinque rotundatis, supra saturate nitide viridibus, infra pallidioribus, cîte calvatis, fructibus turbinatis, saturate coccineis.—*C. microphylla* var. *uvaursi*, Lindl. Bot. Reg. 1187.

The wild specimens we have seen were gathered by Dr. Hooker in Sikkim, at 9—1100 feet; and by Griffith in Bhotan, at 8000—9500 feet.

A bush one or two feet high, with wide-spreading long straight rigid branches. Well-developed leaves measuring half an inch each way, round or with a slight obovate tendency, distinctly mucronate, rounded from the middle to both ends, the upper surface a dark shining green, the lower much paler, at first slightly silky, but becoming quite naked when mature, the venation more distinct than in any of the other forms. Flower three-eighths of an inch across when expanded. Berry turbinate, a brighter scarlet than in the other forms, more than a quarter of an inch deep by a quarter of an inch broad.

Easily recognisable by its round leaves soon naked beneath, and bright-coloured turbinate fruit. The leaves of the elongated branches are often quite horizontal, and spread distichously.—*J. G. B.*

This is the most beautiful of the smaller *Cotoneasters*, with brilliant shining scarlet berries clothing the branches in autumn. It is a dwarf undershrub, growing two to three feet in height, with ascending branches. The leaves are not all retained on the plant during the winter, many of them falling before the new season of growth commences. It is well worthy of cultivation, is hardy, grows freely in any good garden light soil, and can be freely increased by seeds, layers or cuttings. I am indebted to the late Dr. Royle for my plants, which were raised from seeds he presented to me.—*W. W. S.*



W H Fitch, del et lith.

J. N Fitch, imp

Cotoneaster Simonsii, Hort.

TAB. 55.

- C. SIMONSH (*Hort.*) Frutex mediocris, ramis paucis erecto-patentibus, foliis oblongis, apice subdeltoideo-mucronatis, basi paullulum rotundatis, sesqui longioribus quam latis, supra subobscura saturate viridibus, infra pallide viridibus, primum tenuiter albo-sericeis, demum calvatis, fructibus turbinatis, saturate coccineis.

A native of Khasia.

A middle-sized *bush*, with a few elongated erecto-patent *branches*. Fully-grown *leaves* an inch long by about five-eighths of an inch broad, oblong, deltoidly narrowed from above the middle to a mucronate apex, the lower half slightly rounded, the upper surface a duller green than in the last, the lower pale green, thinly silky when young, but nearly or quite naked when mature. *Berries* bright scarlet, turbinate, three-eighths of an inch deep by a quarter of an inch broad.

This has the drupe of *rotundifolia*, but the habit is different, and the leaves are different in shape and texture, and not at all distichous.—*J. G. B.*

I am quite unacquainted with the origin of this plant. I first saw it at a nursery at Weymouth, from whence I obtained my stock. It seems to come nearest in habit to *Cotyledon buxifolia* (see Tab. 52), and is supposed to be from India. It appears to be quite hardy, grows freely in any good soil, and may be increased by seeds or cuttings.—*W. W. S.*

Natural Order CRASSULACEÆ.

Genus COTYLEDON, *Linn.*

Calyx quinquepartitus, corollæ tubo æqualis vel brevior. Corollæ tubus cylindricus, urceolatus vel brevis, teres vel pentagonus, limbi lobis parvis vel elongatis patentibus. Stamina 10, rarissime 5, prope basin corollæ pleraque inserta, filamentis elongatis filiformibus, antheris oblongis inclusis vel paullulum exsertis. Squamulæ hypogynæ lineares, oblongæ vel quadratæ. Ovarii carpella 5, libera, in stylos filiformes vel subulatos interdum exsertos attenuata, stigmatibus oblique capitellatis. Ovula in carpellis indefinita. Folliculi polyspermi. Herbæ vel subfrutices ramosæ vel subscapigeræ, habitu valde variæ. Folia opposita vel alterna, sessilia vel petiolata, sæpe crassissime carnosæ, in paucis peltatæ, sparsæ vel rosulatæ. Flores erecti vel penduli, parvi vel ampli, spicati, racemosi, cymosi vel paniculati. Corollæ lobi æstivatione torti. — *Benth. et Hook. Gen. Plant.* i. p. 659.

It is in the illustration of those tribes of plants of which dried specimens cannot be effectually preserved, or in which the distinctive characters are lost in herbarium examples, that we hope to make our little publication most useful, especially as it naturally happens not unfrequently, in groups or genera of this character, that the horticulturists have outrun the botanists, and that plants which are well known amongst cultivators have never been named or scientifically described. Perhaps we can scarcely find anywhere a better illustration of this than in the American representatives of the genus *Cotyledon*, several of which are widely grown in gardens under the generic name of *Echeveria*. In the first place, let us explain why this name has no rightful claim to be used as generic. In the 'Prodromus,' De Candolle divided the Linnean genus *Cotyledon* into four, in one of which, *Pistorinia*, he placed a single species with the filaments adnate to the corolla-tube, and in the other three he attempted to separate generically the African and American from the Asiatic and European species, restricting the name *Cotyledon* to the plants of the Cape, and calling the New-World species *Echeveria*, and the rest of those of the Old World *Umbilicus*. His characters of the three are as follows :—

COTYLEDON, *D.C. bull. philom.* 1801, n. 49, p. 1. *Cotyledones capenses*, Linn., *Burm.*, *Haw.* Calyx 5-partitus, tubo corollæ multo brevior. Corolla gamopetala, tubo ovato cylindraceo, limbo 5-lobo patenti-reflexo aut revoluta, lobis obtusis. Stamina 10, imo tubo adnata, ceterum libera, exserta aut subinclusa. Squamæ ovales. Carpella 5, in stylos subulatos producta. Frutices carnosì capenses. Folia sæpius sparsa. Flores laxè paniculati, purpurascèntes vel aurantiaci.

UMBILICUS, *D.C. in bull. philom.* 1801, n. 49. *Cotyledonis, spec., Auct.* Calyx 5-partitus. Corolla gamopetala, campanulata, 5-fida, lobis ovatis acutis erectis tubi circiter longitudine. Stamina 10, corollæ inserta. Squamæ 5, obtusæ. Carpella 5, apice attenuata, styli subulatis. Herbæ Europæ Australis aut Orientis indigenæ. Folia rosulata aut alterna, integerrima aut subdentata. Flores albidì aut fluvì, racemosi nec cymosi.

ECHEVERIA, *D.C. MSS.* *Cotyledones americana, Auct.* Calyx 5-partitus, sepalis folia referentibus, erectis, imâ basi subconcretis. Petala 5 inferne coalita erecta crassa rigidula ad nervum medium crassiora et fere basi trigona acuta. Stamina 10, petalis breviora, basi cum petalis concreta. Squamæ 5, breves, obtusæ. Carpella 5, in stylos subulatos abeuntia. Frutices carnosì Mexicani. Folia alterna caulina aut rosulata subopposita integerrima euervia. Flores secus rachin aut secus cymæ ramos sessiles, coccinei aut flavi.—*D.C. Prodr.* vol. iii. p. 461.

The principal distinction relied upon is the shape of the corolla and the depth to which it is divided, and the proportion which the calyx bears to it. DeCandolle knew only four American species, and we are now acquainted with upwards of thirty. The pentagonal character of the corolla to which he alludes may be well seen in our plate of *C. gibbiflora*, Tab. 65, but not above half the species now known show this clearly. As may be seen from our figures also (compare those of *C. aloides* and *gibbiflora*), the calyx varies from a sixth as long as the corolla to quite as long, and the lobes are very variable in shape. It might be possible to separate the American from the Cape species by the one sole character of the fission of the corolla. In the Cape plants it is never divided more than half-way down and generally not more than a third or a quarter, and in the American ones it is always cleft nearly down to the base, but when the European and Asiatic species have to be considered they completely break down the line of demarcation, and render it quite impossible to give any general character which will

separate the species of the three geographical areas. In the best-known European species, *C. Umbilicus* (*Umbilicus pendulinus*, D.C.), for instance, there is a perfectly tubular corolla, with lobes that do not reach above a quarter of the way down, and a calyx not more than a quarter as long as the tube. But the Pyrenean *U. sedoides*, D.C., has a campanulate corolla slit nearly to the base, with a calyx half its length; and the Siberian *U. spinosus*, *malacophyllus* and *leucanthus*, and Himalayan *U. oreades* and *spathulatus*, have also the petals as nearly free as in the American plants, and the calyx in some of them is quite as long as the corolla. Many of the Asiatic species have cymose or paniculate flowers, and in the Siberian *U. Lievenii* we have a cyme, calyx and corolla quite identical with that of the American *C. cæspitosa*. So that the three Candollean genera quite break down for want of characters, and it is the same with the more recently proposed *Pachyphytum* of Klotzsch; and we endorse cordially the view taken by Bentham and Hooker, in their 'Genera Plantarum,' of the classification and nomenclature of these plants.

So many of these American *Cotyledons* still remain undescribed, and the descriptions of the others are scattered so widely and drawn up with so little uniformity of plan that we have concluded that the only way of dealing with the plants effectually would be to pass all the New-World species under review, and to attempt to classify them in systematic order. The following therefore is as complete a monograph as we can furnish of the American species, and we give figures, so far as we have been able to procure them, of those which have not been adequately figured already.

§ Spicatæ.

1. *C. PUBESCENS* (*Baker*). Longe caulescens, dense griseo-pubescens, foliis aggregatis, obovato-spathulatis, acutis, duplo longioribus quam latis, e basi tertii superioris spathulatim angustatis, utrinque pallide viridibus, ramorum floriferorum paucis, valde reductis, floribus 15—25, subdense spicatis, bracteis linearibus, inferioribus floribus excedentibus, sepalis linearibus inæqualibus patulis, corollâ flavo-rubrà subæquantibus. — *Echeveria pubescens*, *Schlecht.* Linn. xiii. p. 411; *Hort. Hal.* t. 9; *Walp. Rep.* ii. p. 295.

Mexico.

Stems grayish or reddish brown, like the rest of the plant between shaggy and velvety with gray pubescence, often one or

two feet high and an inch thick, marked with the round scars of the fallen leaves. *Leaves* obovate-spathulate, eight to twelve aggregated towards the apex of the stem in a lax rosette, the largest three to three and a half inches long by an inch and a half broad, spathulately narrowed from two-thirds of the way up, the point subacute, the base subterete, two to three lines thick, the lamina half as thick, the face concave, the colour a pale green, tinged with red when fading, and both sides so densely pubescent that in some lights they look nearly white. *Flowering branches*, including the spike, about a foot long, their leaves few and much reduced. *Spike* occupying about half the branch, composed of fifteen to twenty-five flowers, the upper part dense, the lower laxer. *Bracts* linear, the lower ones exceeding the flowers. *Sepals* linear, unequal, spreading, about as long as the *corolla*, which is subpentagonal, five-eighths of an inch deep, bright red on the outside, yellow in the throat within.

2. *C. COCCINEA* (Cav. *Ic. ii. p. 54, t. 170*). Longe caulescens, griseo-pubescent, foliis aggregatis, oblanceolato-spathulatis, triple vel quadruplo longioribus quam latis, acutis, e basi tertii superioris spathulatim angustatis, utrinque pallide viridibus, ramorum florum paucis, valde reductis, floribus 15—25, subdense spicatis, bracteis linearibus, inferioribus floribus excedentibus, sepalis linearibus patulis inæqualibus corollâ flavo-rubrà subæquantibus. — *Bot. Mag. t. 2572*; *Lodd. Bot. Cab. t. 832*; *Echeveria coccinea, D.C. Prodr. iii. p. 401*.

Mexico.

Stems grayish or reddish brown, finely gray-pubescent like the rest of the plant, often one or two feet long, and an inch thick, marked with round scars. *Leaves* oblanceolate-spathulate, eight to twelve aggregated towards the apex of the stem, the largest three to four inches long by three-fourths of an inch to one inch broad, the point acute, the lower three-quarters spathulately narrowed to a terete base, the lamina an eighth of an inch thick, both sides gray-pubescent, when fading tinged with red. *Flowering branches*, including the spike, about a foot long, their leaves few and much reduced; the *spike* about half the length, of fifteen to twenty-five flowers. *Sepals* and *corolla* as in the last species.

Very near the last, with which in general habit and the arrangement and character of the flowers it quite agrees, but the leaves considerably narrower and the pubescence finer.

3. *C. ROSEATA* (Baker). Caulescens, glabra, foliis sublaxis, oblanceolato-spathulatis, triplo vel quadruplo longioribus quam latis, acutis, e basi tertii superioris spathulatim angustatis, utrinque glauco-viridibus, infra et margine rubro-tinctis, ramorum floriferorum numerosis, lanceolato-spathulatis, roseis, floribus 30—70 dense spicatis, bracteis et sepalis linearibus roseis corollâ pallide flavâ æquantibus. — *Echeveria rosea*, Lindl. Bot. Reg. 28, t. 22; Walp. Rep. ii. p. 259. *Courantia echeveroides*, Lemaire, Jard. Fleur. vol. i. Suppl. p. 91.

Mexico.

Stem glabrous, pale green, slightly glaucous, a foot or more high, a quarter to half an inch thick, the scars roundish. *Leaves* twenty to thirty spread over three or four inches at the apex of the stem, oblanceolate-spathulate, the largest two and a half to three inches long by three-fourths of an inch broad three-quarters of the way up, the point acute, the lower part spathulately narrowed to a terete base, the lamina a line thick, both sides quite glabrous, glaucous-green with a reddish tinge at the edge and beneath, especially when old. *Flowering branch* a foot high, the leaves dense, spreading, lanceolate-spathulate, deeply tinged with red; the *spike* dense, 30- to 50- or even 70-flowered; the *bracts* rose-red, linear, equalling the flowers. *Sepals* linear, rose-red, equalling the *corolla*, which is pale yellow and but slightly pentagonal. *Filaments* joined together from the base to the middle.

A very well-marked species, not closely allied to any other. There is already a *C. rosea* of Lessing from Siberia. On account of the peculiar structure of the stamens Lemaire has proposed it as the type of a new genus.

4. *C. MUCRONATA* (Baker). Acaulis, glabra, foliis dense rosulatis, anguste obovato-spathulatis, triplo vel quadruplo longioribus quam latis, acutis, utrinque viridibus, ramorum floriferorum paucis reductis, floribus 20—30 laxè spicatis, bracteis lanceolatis, sepalis lanceolatis ascendentibus subæqualibus corollâ flavo-rubrà ultra duplo brevioribus. — *Echeveria mucronata*, Schlecht. Linn. xii. p. 411; Hort. Hal. p. 19, t. 10.

Mexico.

Glabrous, not at all caulescent. *Leaves* in a dense rosette, narrowly obovate-spathulate, the largest three to four inches long by an inch broad three-quarters of the way up, the point acute, both sides green. *Flowering branch*, including the raceme, a foot and a half to two feet long, with a few distant spreading reduced leaves in the lower half, the flowers twenty to thirty in a narrow

spike about a foot long. *Bracts* lanceolate, the lower ones equaling the *sepals*, which are also lanceolate, thick, subequal, ascending, a quarter of an inch long. *Corolla* five-eighths of an inch deep, subpentagonal, urceolate, mixed red and yellow.

Of this we have not seen either living or dried specimens, but judging from Schlechtendahl's excellent figure and descriptions it seems a very well-marked species.

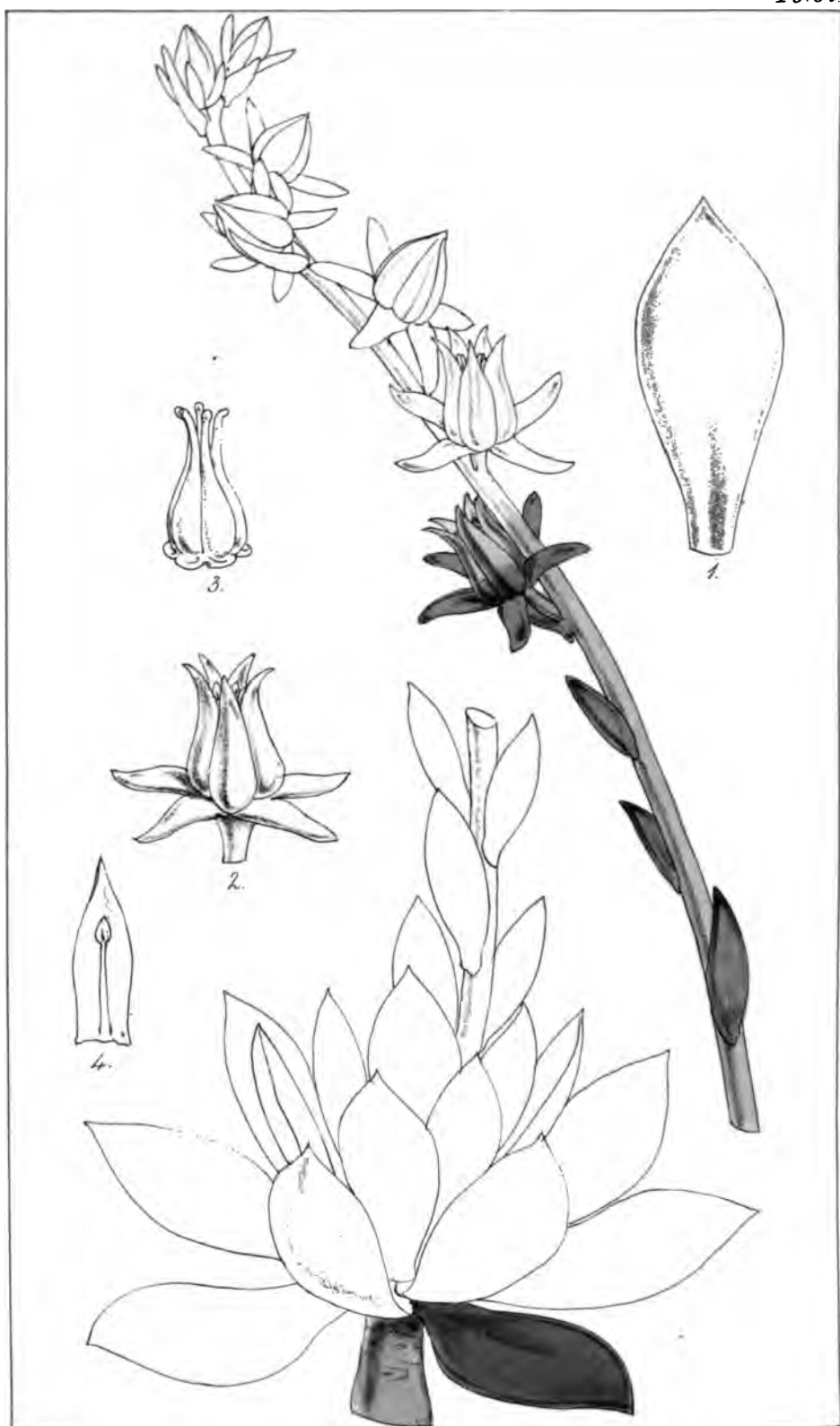
§§ Racemosæ.

5. *C. quitensis* (Baker). *Caulescens*, glabra, foliis laxis, oblanceolatis, quadruplo longioribus quam latis, apice rotundatis, obtuse apiculatis, deorsum e basi tertii superioris subspathulatim angustatis, utrinque pallide nitide viridibus, demum rubro tinctis, ramorum floriferorum numerosis, paullulum reductis, floribus 4—8, æquilateraliter racemosis, bracteis oblanceolato-spathulatis pedicellis erecto-patentibus longioribus, sepalis lanceolatis subæqualibus corollâ flavo-rubrà duplo brevioribus.—*Sedum quitense*, H. B. K. *Nov. Gen.* vi. p. 46. *Echeveria quitensis*, Lindl. *Journ. Hort. Soc.* vii. p. 269.

Andes of New Granada.

Stem six to nine inches high, one-fourth of an inch thick, gray when mature, naked, light green when young, the scars roundish. *Leaves* twenty-five to thirty, spreading, not aggregated, oblanceolate, the largest an inch or rather more long by three-eighths of an inch broad five-sixths of the way up, the apex rounded with a slight point, the lower three-quarters slightly spathulately narrowed, the blade one-eighth of an inch thick, the colour a shining bright light green, finally tinged with red. *Flowering branches* half a foot long, with several tolerably close erecto-patent leaves, like those of the stem, but smaller. *Flowers* four to eight in a tolerably close raceme an inch and a half to two inches long. Lower *bracts* oblanceolate, half an inch to five-eighths of an inch long. *Pedicels* erecto-patent, the lowest one-fourth to three-eighths of an inch long. *Sepals* lanceolate, ascending, slightly unequal, about half as long as the *corolla*, which is reddish yellow, half an inch deep, decidedly pentagonal.

A very distinct species.



W.W.S. del. Fitch, lith.

J.N. Fitch, imp.

Cotyledon nodulosa, Baker.

TAB. 56.

6. *C. NODULOSA* (*Baker*). Caulescens, glabra, foliis rosulatis, obovato-spathulatis, triplo longioribus quam latis, acutis, e basi tertii superioris deorsum spathulatim angustatis, utrinque subglaucoviridibus, infra et margine rubro-tinctis, ramorum floriferorum numerosis, ascendentibus, floribus 4—6, laxè æquilateraliter racemosis, bracteis minimis, pedicellis brevibus, demum erecto-patentibus, sepalis patulis, linearibus, corollâ rubro-stramineâ paulo brevioribus.

Mexico.

Stems naked, grayish brown, attaining a height of six or eight inches and a thickness of half an inch, tumid, gouty, the scars twice as broad as deep. *Leaves* obovate-spathulate, aggregated at the apex of the stem in a dense rosette, the largest two inches to two inches and a half long by three-fourths of an inch broad three-quarters of the way up, the apex subdeltoid with a mucro, the lower two-thirds spathulately narrowed to a base two to three lines broad, the colour a dull apple-green with a slight glaucous tinge, the under surface and edge more or less tinged with red. *Flowering branches* six to nine inches long, their leaves close and ascending, gradually diminishing upwards, but the lowest not much smaller than those of the rosette. *Flowers* four to six in a lax *raceme* three to four inches long. *Bracts* linear, the lower ones not more than half an inch long. *Pedicels* finally erecto-patent, the lowest two to three lines long. *Sepals* three-eighths of an inch long, linear, spreading. *Corolla* half an inch long, decidedly pentagonal, straw-yellow tinged with red.—*J. G. B.*

This species should be grown in a mixture of light sandy loam and leaf-mould, and during the winter months it requires but little water. A warm, dry, light greenhouse is found to be the most suitable for its healthy cultivation. The plant flowers freely, and may be increased by seeds or cuttings. I obtained it some years since, with other plants which I understood came from Mexico.—*W. W. S.*



W.H. Fitch, del. et sculp.

W.H. Fitch

Cotyledon nuda, Baker

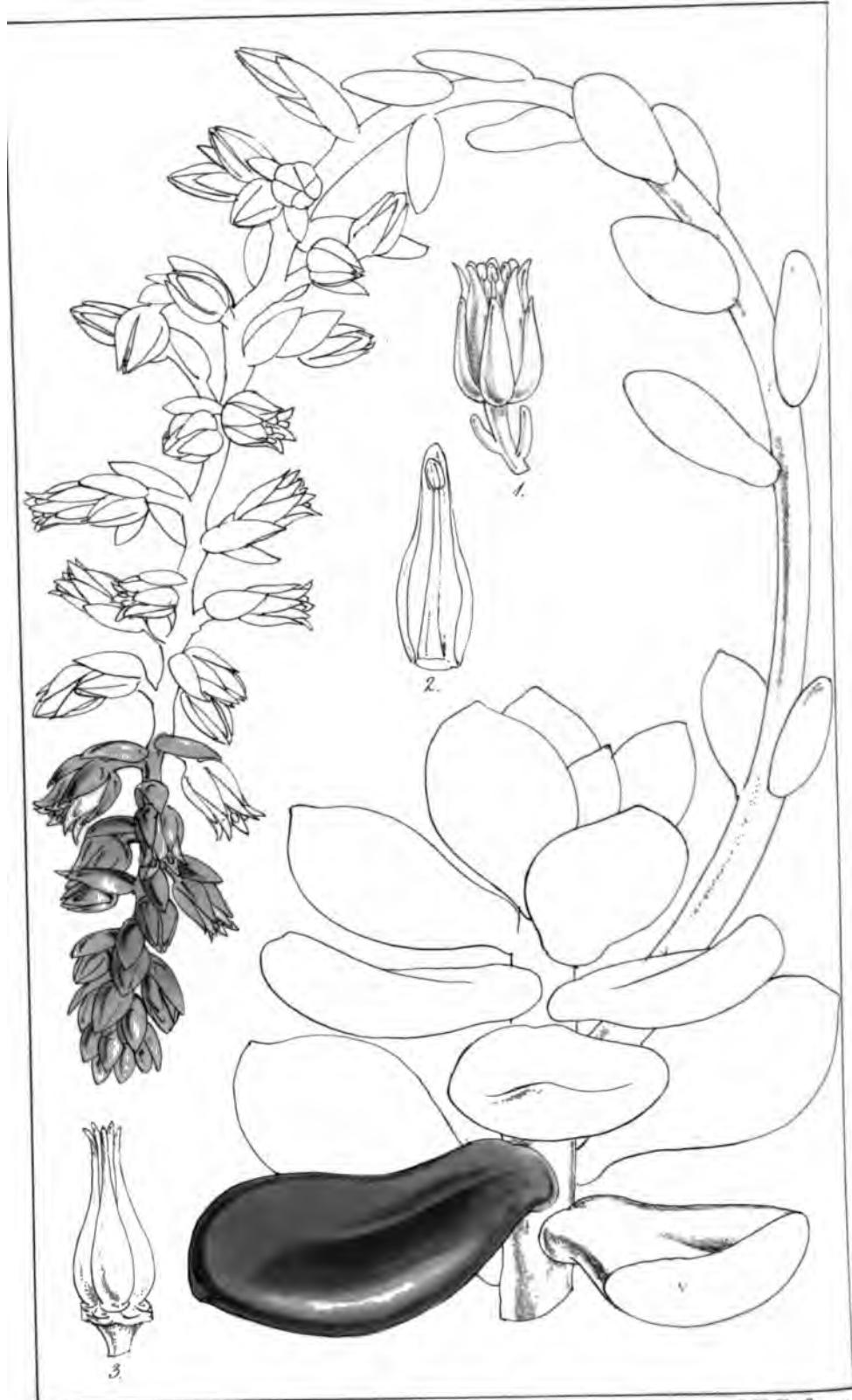
TAB. 57.

7. *C. NUDA* (Baker). Caulescens, glabra, foliis obovato-spathulatis, sub-laxis, duplo longioribus quam latis, sursum rotundatis, apice mucronatis, deorsum e basi tertii superioris spathulatim angustatis, pallide glauco-viridibus, paullulum rubro-tinctis, ramorum floriferorum numerosis ascendentibus, floribus 10—15, subdense æquilateraliter racemosis, pedicellis brevibus, erecto-patentibus, sepalis crassis, linearibus, patulis, inæqualibus, corollâ flavo-rubrá æquantibus.

Mexico.

Stems glabrous, glaucous-green, attaining a height of six or eight inches and a thickness of three-eighths of an inch, the scars roundish. *Leaves* obovate-spathulate, twelve to fifteen aggregated towards the apex of the stem, the largest above two inches long by an inch broad three-quarters of the way up, the apex rounded and mucronate, the lower two-thirds spathulately narrowed to a roundish base. *Flowering branch* six to twelve inches long, its leaves numerous and ascending. *Raceme* 12- to 20-flowered, moderately dense, more than an inch in thickness. *Bracts* linear, falling as the flowers expand, three to four lines long. *Pedicels* one-eighth of an inch long, at first spreading, finally erecto-patent. *Sepals* thick, linear, unequal, spreading horizontally, the longest equalling the *corolla*, which is under half an inch long, decidedly pentagonal, pink in the lower part, straw-coloured upwards and within.—*J. G. B.*

This species does well, treated and grown in a similar manner to the foregoing. I have had the plant for some years, but have no information as to its origin.—*W. W. S.*



W. W. S. del. Fitch, lith.

J. N. Fitch, imp.

Cotyledon linguaefolia, Baker.

TAB. 58.

8. *C. LINGUÆFOLIA* (Baker). Longe caulescens, glabra, foliis laxis, percrassis, obovato-spathulatis, duplo longioribus quam latis, apice rotundatis, obtuse apiculatis, deorsum e basi tertii superioris spathulatim angustatis, utrinque pallide viridibus, ramorum floriferorum paucis, reductis, floribus 20—30 in racemum nutantem modice confertum interdum infra compositum dispositis, bracteis ovatis, pedicellis patentibus excedentibus, sepalis percrassis, linearibus, obtusis, æqualibus, corollâ obscure stramineâ paulo brevioribus. —*Echeveria linguæfolia*, Lemaire, *Illust. Hort.* vol. x., *Suppl.* p. 81. *Pachyphytum Lingua*, Hort.

Mexico.

Stems attaining a height of twelve to eighteen inches, three-fourths to one inch thick, light green, the scars roundish-oblong. *Leaves* laxly aggregated towards the summit of the stem, obovate-spathulate, when fully developed two to two and a half inches long by one to one and a quarter inch broad three-quarters of the way up, the apex rounded to a blunt point, the lower two-thirds spathulately narrowed, the centre of the lamina half an inch thick, the face decidedly flattened, the back rounded, both sides a bright light apple-green, not glaucous. *Flowering branch* more than a foot long, its leaves few and scattered, oblong, an inch or less long. *Flowers* twenty to thirty in a moderately close drooping equilateral *raceme*, which is sometimes a little compound towards the base. *Bracts* narrow-oblong, very thick, three-eighths to half an inch long, exceeding the simple *pedicels*, which are spreading or the lower ones deflexed. *Sepals* linear-lanceolate, equal, very thick, appressed to the *corolla*, which is dull straw-coloured, three-eighths of an inch long and hardly at all pentagonal.—*J. G. B.*

This robust and remarkable species will grow freely in any ordinary greenhouse, if kept moderately dry at the roots during the winter months. It should be potted in a mixture of turfy loam and sand, and is easily increased by cuttings or by the leaves, which will root readily if placed in light sandy soil, the larger portion of the leaf being above the ground. My plants were obtained from one of the Belgium nurseries.—*W. W. S.*

9. *C. CANALICULATA* (Baker). Breviter caulescens, glabra, foliis dense rosulatis oblongo-ligulatis e centro utrinque attenuatis, purpureo-viridibus, concavis, ramorum floriferorum numerosis, sursum decrescentibus, floribus 12—20 subaxe æquilateraliter racemosis, bracteis linearibus pedicellis erecto-patentibus subæquantibus, sepalis parvis, linearibus patulis vel recurvatis corollâ saturate rubrâ multo brevioribus.—*Echeveria canaliculata*, Hook. Bot. Mag. t. 4986.

Mexico.

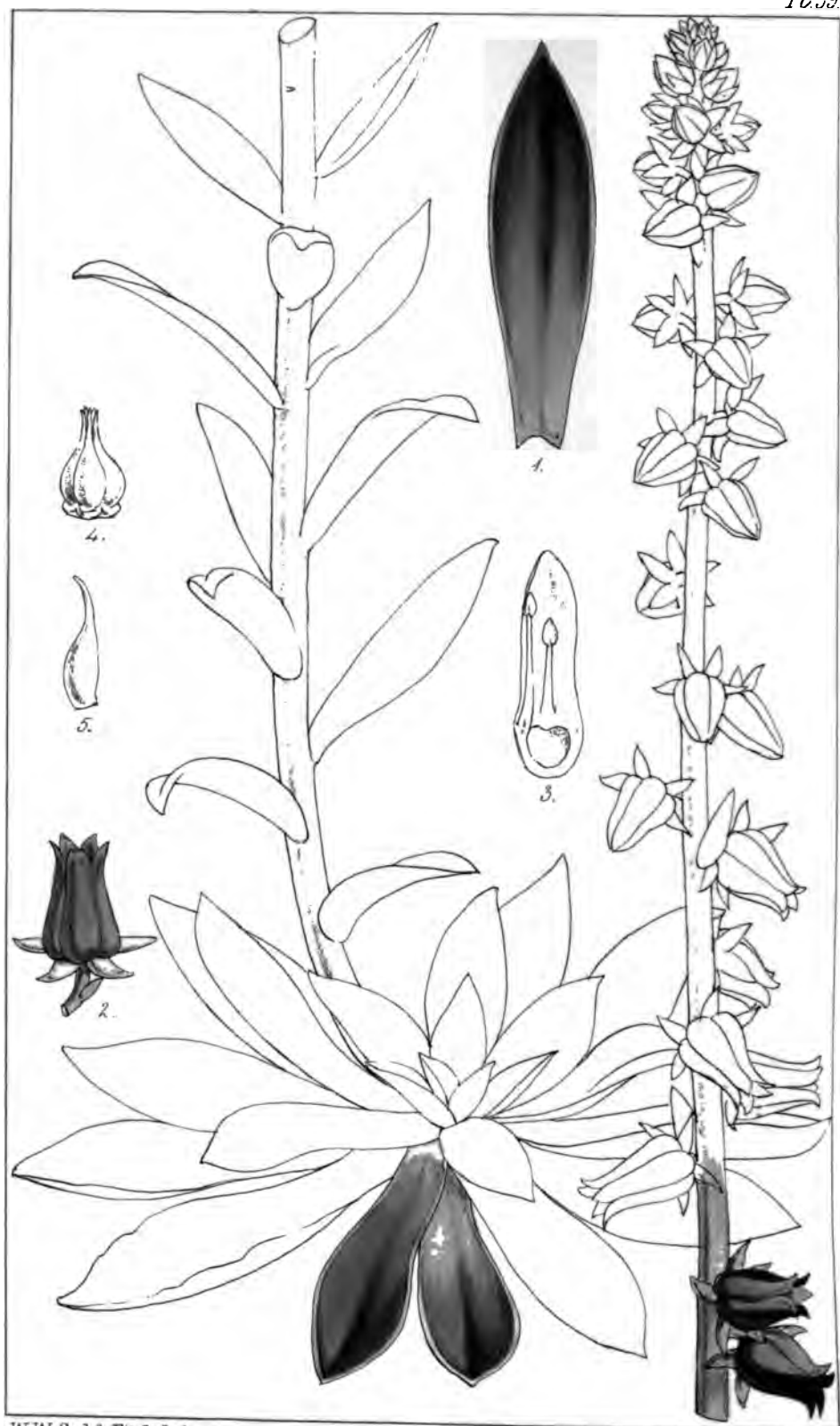
Stems glabrous, attaining a height of four to six inches and a thickness of an inch or more, the scars three or four times as broad as deep. *Leaves* twelve to twenty aggregated in a dense rosette, the largest four to five inches long by an inch broad at the middle, ligulate-oblong, acute, not at all spatulate downwards, the face concave, both sides a glaucous-green much tinged with purple. *Flowering branch*, including the raceme, a foot and a half to two feet long, its leaves numerous and moderately close, gradually diminishing upwards. *Flowers* twelve to twenty in a moderately dense equilateral *raceme* six to nine inches long. *Bracts* linear, the lower one half to five-eighths of an inch long, equalling the erecto-patent lanceolate *pedicels*. *Sepals* subequal, linear, glaucous, horizontally spreading or reflexed, about four lines long. *Corolla* bright red, yellowish within, nearly an inch deep, decidedly pentagonal.

10. *C. PERUVIANA* (Baker). Acaulis vel breviter caulescens, glabra, foliis dense rosulatis, obovato-spathulatis, acutis, glaucis, floribus 20—30 in racemum laxum æquilaterale dispositis, bracteis linearibus, pedicellis erecto-patentibus, sepalis lanceolatis æqualibus ascendentibus corollâ rubrâ duplo brevioribus.—*Echeveria peruviana*, Meyen Reise, i. p. 448; Walp. Rep. v. p. 794.

Andes of Peru.

Not at all or very shortly caulescent, glabrous. The *leaves* in a dense rosette, obovate-spathulate, the largest in a dried specimen two inches long by an inch broad two-thirds of the way up, acute, very glaucous. *Flowers* twenty to thirty in a lax erect equilateral *raceme* about a foot long. *Bracts* linear, exceeding the erecto-patent *pedicels*, which are a quarter to half an inch long. *Sepals* lanceolate, ascending, equal, a quarter of an inch long. *Corolla* reddish, half an inch long.

We have not seen this living, but have examined a dried specimen from the Cordilleras of Peru, *Lechler*, 1775.—*J. G. B.*



W.W.S. del. Fitch, lith.

J.N. Fitch, imp.

Cotyledon hirsuta, Baker.

TAB. 59.

11. *C. LURIDA* (Baker). Acaulis, glabra, foliis dense rosulatis oblongo-ligulatis, triplo vel quadruplo longioribus quam latis, acutis, facie concavis, glauco-viridibus, plus minus luride purpureo tinctis, ramorum floriferorum laxis, valde reductis, floribus 12—20 in racemum erectum æquilaterale deorsum laxum dispositis, bracteis parvis linearibus deciduis, pedicellis brevibus patentibus, sepalis linearibus horizontaliter patulis corollâ rubrâ duplo brevioribus.—*Echeveria lurida*, Lindl. Bot. Reg. 27, t. 1; Walp. Rep. ii. p. 259. *E. racemosa*, Schlecht. et Cham. Linn. v. p. 554; Bot. Mag. t. 3570; Walp. Rep. ii. p. 259.

Mexico.

Not at all caulescent, glabrous. The leaves fifteen to twenty in a dense rosette, ligulate-oblong, the largest three to four inches long by an inch broad three-quarters of the way up, the face concave, the point acute, both sides glaucous-green, deeply tinged with dull purple, especially when old, the edge cartilaginous. Flowering branches twelve to eighteen inches long, the leaves lax, ascending and much reduced. Flowers twelve to twenty in an erect equilateral raceme, lax in the lower half. Bracts small, linear-lanceolate, falling as the flowers expand. Pedicels two to three lines, spreading or the lowest cernuous. Sepals thick, linear, spreading horizontally, subequal, a quarter of an inch long. Corolla bright red, half to five-eighths of an inch deep, decidedly pentagonal.—J. G. B.

This is a dull-coloured species, requiring a warm dry greenhouse treatment. It is most impatient of water in the winter season, and should be grown in sandy leaf-mould in well-drained small pots. It may be increased by offsets, seeds or leaves, treated as recommended under *Cotyledon linguæfolia*. I am indebted to the Royal Gardens, Kew, for this interesting species.—W. W. S.

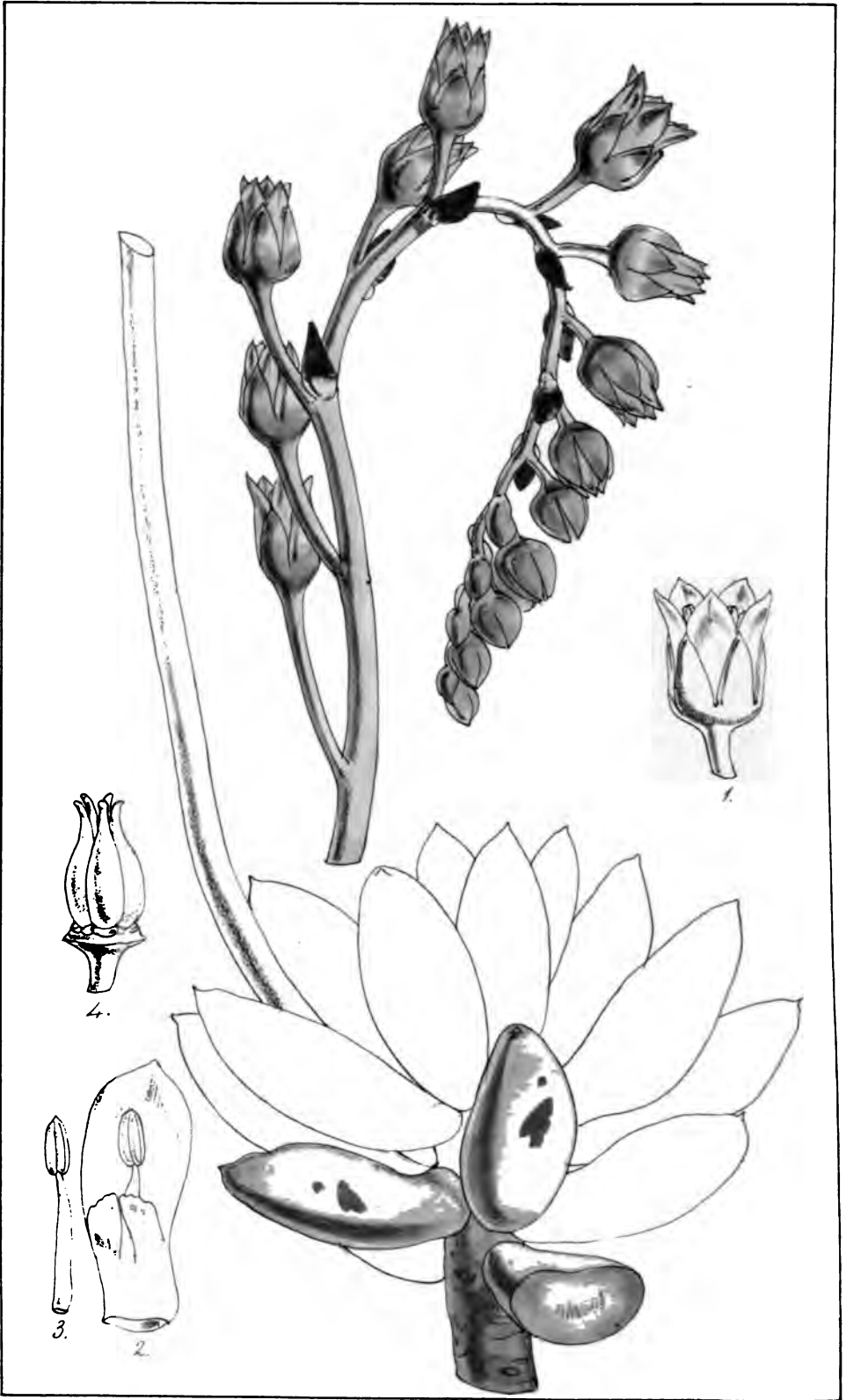
§§§ Secundæ.

12. *C. PACHYPHYTUM* (Baker). Caulescens, glabra, foliis percrassis, aggregatis, oblanceolato-subspathulatis, triplo vel quadruplo longioribus quam latis, apice rotundatis, ægre apiculatis, deorsum e basi tertii superioris subspathulatim angustatis, utrinque farinoso-glaucis, paullulum purpureo tinctis, ramorum floriferorum paucis, valde reductis, floribus 12—18 in racemum confertum secundum aduncum dispositis, bracteis magnis, oblongis, basi biauriculatis, imbricatis, persistentibus, pedicellis brevibus crassis, sepalis magnis, valvatis, oblongo-spathulatis, corollâ saturate rubrâ paullulum excedentibus. — *Pachyphytum bracteosum*, Klotzsch in Otto et Dietr. *Allg. Gart. 9 Jahr.* p. 9; *Ic. Pl. Rar. Hort. Ber.* p. 107, t. 43; *Hook. Bot. Mag.* t. 4951.

Mexico.

Glabrous; the *stem* attaining a height of six to twelve inches and a thickness of an inch and a half, very glaucous, the scars roundish. *Leaves* oblanceolate-subspathulate, twenty to forty aggregated towards the apex of the stem, spreading over a space of four to eight inches, the lower ones spreading horizontally, the largest three to four inches long by about an inch broad three-quarters of the way up, the apex rounded, bluntly pointed, the lower two-thirds slightly spathulate, the base subterete, half an inch thick, the centre of the blade a quarter of an inch thick, both sides exceedingly glauco-farinose, with a slight purplish bloom towards the edge. *Flowering branches* a foot and a half to two feet long, a quarter of an inch thick, firm, terete, farinose, with a few scattered much-reduced leaves, which usually fall before the flowers expand. *Flowers* twelve to eighteen in a close decurved secund *raceme* four to six inches long, which finally becomes nearly erect. *Bracts* oblong, an inch long, closely tiled over one another in two rows, sharply spurred on each side at the base. *Pedicels* very thick, two to three lines long, the lower ones patent, the upper ones ascending. *Calyx* deeply campanulate, eight to nine lines long, the divisions oblong-spathulate, often unequal, valvate, completely enclosing the bright red *corolla*.

A very distinct species, remarkable for its large bracts and calyx.—*J. G. B.*



W.W.S. del. Fitch, hch.

J.N. Fitch. imp

Cotyledon adunca, Baker.

TAB. 60.

13. *C. ADUNCA* (Baker). Longe caulescens, glabra, foliis percrassis, laxis, oblongis, duplo longioribus quam latis, apice apiculatis, facie explanatis, dorso rotundatis, utrinque pallide glauco-viridibus, ramorum floriferorum subnullis, floribus 12—18 in racemum laxum secundum aduncum dispositis, bracteis crassis, lanceolatis, parvis, pedicellis erecto-patentibus, sepalis lanceolatis æqualibus corollâ rubro-aurantiâ ægre duplo brevioribus.—*Pachyphytum roseum*, Hort.

Mexico.

Stems attaining a height of two to four feet and a thickness of half to three-quarters of an inch, glabrous, pale grayish brown, the scars roundish. *Leaves* narrow-oblong, the upper ones close, the lower lax, eighteen lines to two inches long by three-quarters of an inch broad, the apex apiculate, the blade half an inch thick in the centre, the face flattened, the back rounded, both sides a pale glaucous-green, not at all tinged with purple. *Flowering branch* a foot or more long, with a few minute bract-like leaves, the upper part permanently decurved. *Raceme* secund, 12- to 18-flowered, six to eight inches long when fully developed. *Bracts* lanceolate, not more than three to four lines long. *Pedicels* erecto-patent, the lower ones finally six to seven lines long, but the upper much shorter. *Calyx* three-eighths of an inch deep, the teeth equal, lanceolate, adpressed to the *corolla*, which is very slightly pentagonal, five-eighths of an inch deep, rose-pink upwards, pale yellow downwards and within.—J. G. B.

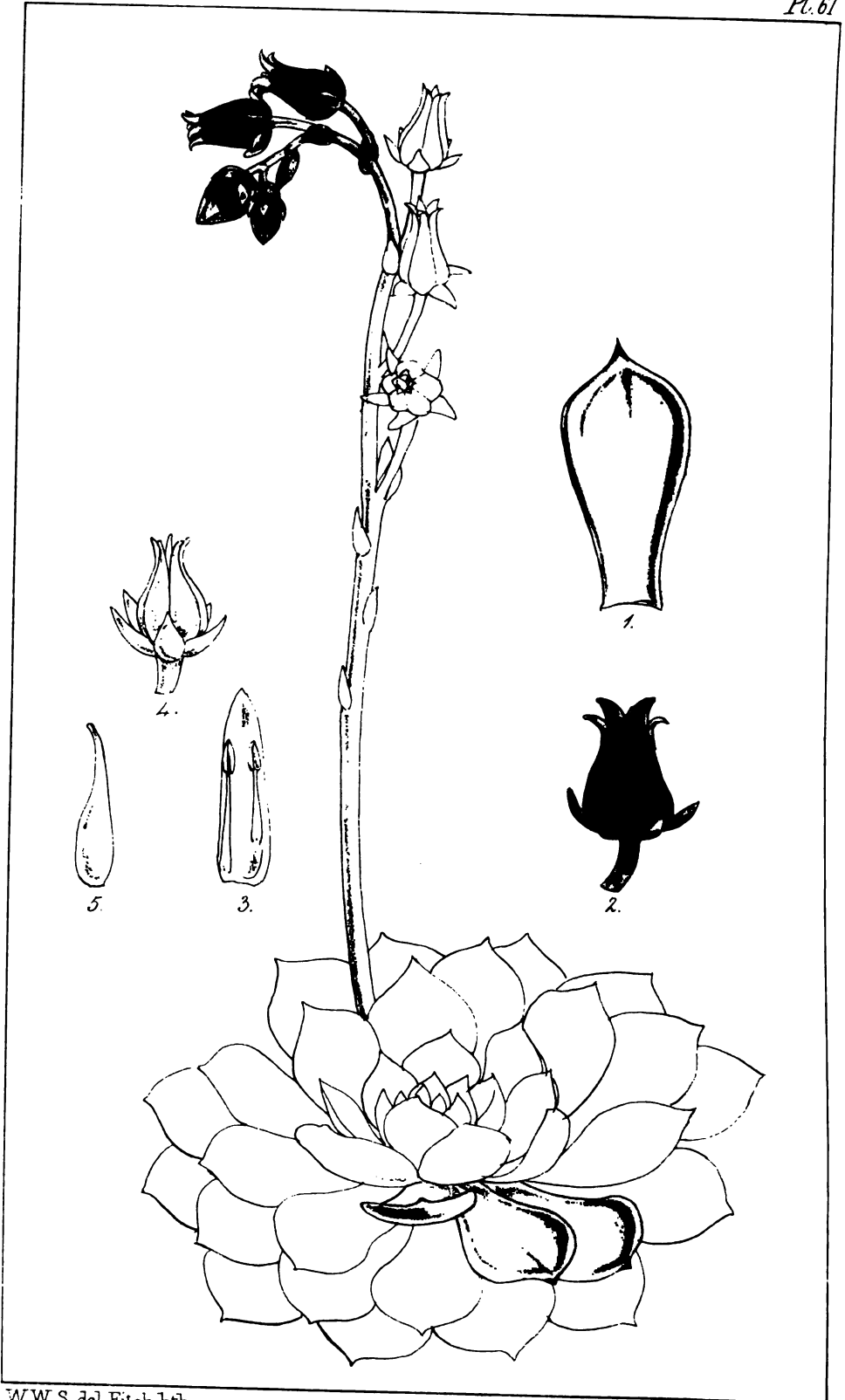
A tall-growing species, attaining at times a height of four feet, and requiring an ordinary greenhouse treatment. It thrives, grown in turfy loam and sand, with plenty of drainage, and supplied with but little water during the winter season. It is easily increased by seeds, cuttings, or by the leaves, planted in nearly dry sand. I am indebted to the Royal Gardens at Kew for this fine species.—W. W. S.

14. *C. SECUNDA* (Baker). Acaulis, glabra, foliis dense rosulatis, obovato-cuneatis, ægre duplo longioribus quam latis, apice rotundatis conspicue mucronatis, dimidio inferiore cuneatis, utrinque pallide viridibus, primum subglaucis, demum saturate rubro tinctis, ramorum floriferorum subnullis, floribus 12—15 in racemum secundum deorsum laxum dispositis, bracteis oblongis pedicellis erecto-patentibus brevioribus, sepalis æqualibus lanceolatis ascendentibus corollâ rubro-aurantiâ duplo brevioribus.—*Echeveria secunda*, Lindl. Bot. Reg. xxiv. Suppl. p. 59, vol. xxvi. t. 57; Schlecht. Hort. Hal. p. 20. *E. spilota*, Kunze, MSS.

Mexico.

Glabrous, not at all caulescent, stoloniferous from the crown of the root. The *leaves* fifty or more in a very dense rosette, the outer ones slightly ascending, broadly obovate-cuneate, an inch and a half to an inch and three-quarters long by an inch broad three-quarters of the way up, the apex rounded with a very distinct mucro, the lower two-thirds cuneately narrowed to a broad base, the colour a pale apple-green, with a slight glaucous tinge when young, the upper part of the old leaves deeply tinged with scarlet. *Flowering branch* a foot high, slender, terete, pinkish glaucous, with only a few distant small bract-like leaves. *Flowers* twelve to fifteen in a second *raceme*, which is finally four to six inches long. *Bracts* oblong, two to three lines long. *Pedicels* slender, erecto-patent, the lowest three to four lines long. *Sepals* lanceolate, equal, two lines long, at first spreading, finally ascending. *Corolla* three-eighths of an inch deep, hardly at all pentagonal, bright red downwards, bright yellow upwards and within.

We have seen a single specimen with the lowest pedicel forked. Schlechtendahl ('Linnæa,' xiii. p. 411) describes an *Echeveria bifida* from Mexico which resembles this, but has a pair of second racemes three to six inches long.—*J. G. B.*



W.W.S. del Fitch, hth

J.N. Fitch. imp.

Cotyledon glauca, Baker.

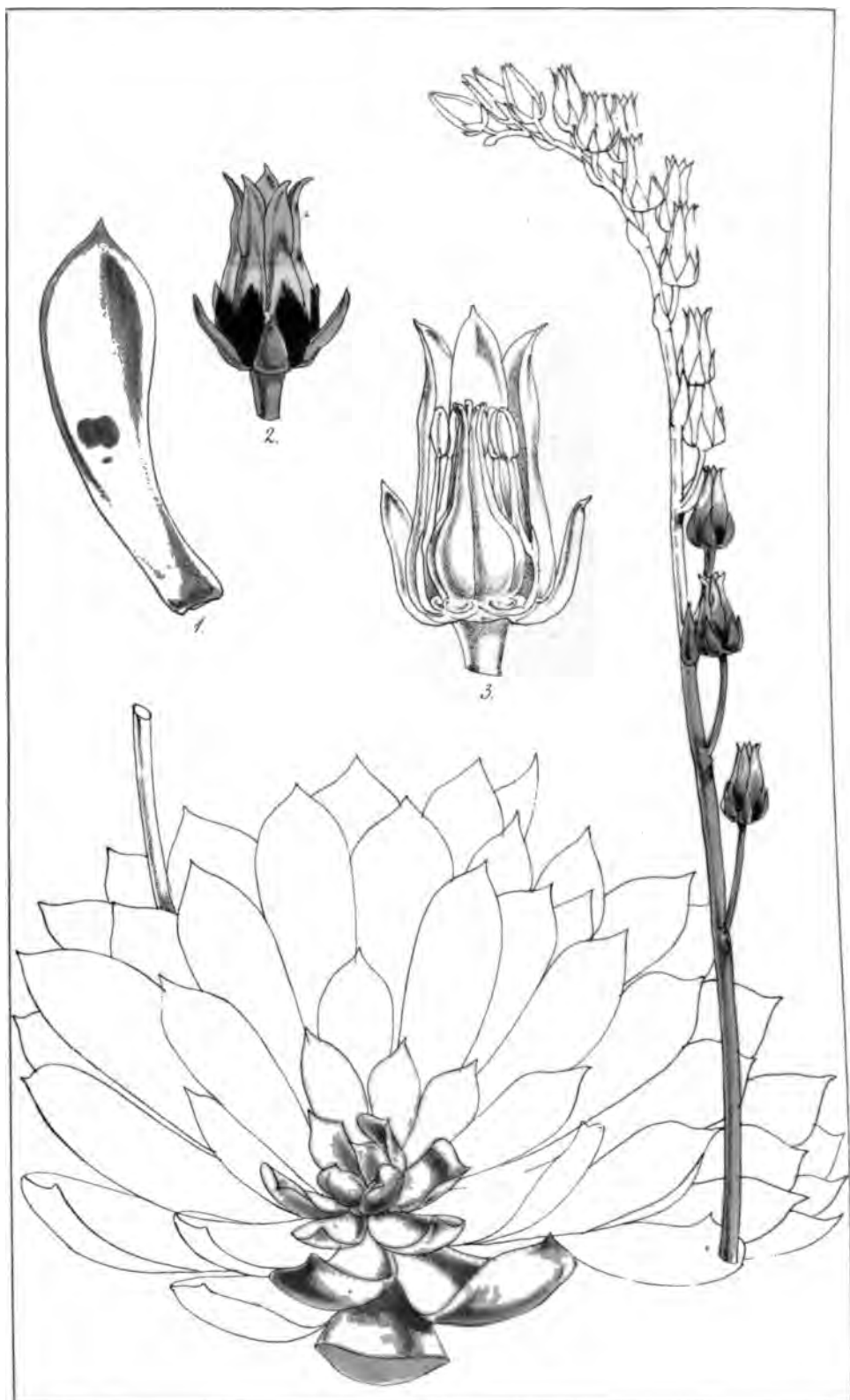
TAB. 61.

15. *C. GLAUCA* (Baker). Acaulis, glabra, foliis dense rosulatis, obovato-cuneatis, ultra duplo longioribus quam latis, apice rotundatis, conspicue mucronatis, deorsum e basi tertii superioris cuneato-angustatis, utrinque farinoso-glaucis, demum margine paullulum rubro tinctis, ramorum floriferorum subnullis, floribus 12—20 in racemum secundum deorsum laxum dispositis, bracteis oblongis pedicellis erecto-patentibus brevioribus, sepalis æqualibus lanceolatis ascendentibus, corollâ rubro-aurantiaca duplo brevioribus. — *Echeveria glauca*, Hort.

Mexico.

Glabrous, not at all or very shortly caulescent, densely stoloniferous from the crown of the root. The leaves forty to fifty in a very dense rosette, the outer ones almost horizontal, quite two inches long by three-fourths to seven-eighths of an inch broad five-sixths of the way up, the point more or less rounded to a decided mucro, the lower three-quarters cuneately narrowed, both sides extremely glaucous, only the edges of the fading leaves a little tinged with red. Flowering branches a foot high, slender, terete, pinkish glaucous, with only a few distant small bract-like leaves. Flowers twelve to twenty in a second raceme which is finally four to six inches long. Bracts ovate-oblong, two lines long. Pedicels, sepals and corolla just as in *C. secunda*. — J. G. B.

A very pretty compact dwarf-growing species, requiring a dry and light situation in the greenhouse during the winter, and during the summer it does very well in the open air, growing freely on rock-work, or as an edging, in which situation, from its glaucous appearance, it produces a very pleasing effect. It is easily increased by offsets and seeds. The plant originally came to me from Mons. Van Houtte's nursery at Ghent. — W. W. S.



W H Fitch, del et lith

J. N. Fitch, imp.

Cotyledon pumila, Baker

TAB. 62.

16. *C. PUMILA* (Baker). Acaulis, glabra, foliis dense rosulatis, oblanceolato-cuneatis, triplo longioribus quam latis, apice subdeltoideis, mucronatis, utrinque glaucis, demum rubro-tinctis, ramorum florum subnullis, floribus 8—12 in racemum secundum deorsum laxum dispositis, bracteis lanceolatis, pedicellis erecto-patentibus æquantibus, sepalis æqualibus lanceolatis corollâ saturate rubro-aurantiâ duplo brevioribus.—*Echeveria pumila*, "Van Houtte, Cat. 1846 ;" *Schlecht. Hort. Hal.* p. 20.

Mexico.

Not at all caulescent, glabrous, copiously stoloniferous from the crown of the root. The *leaves* fifty to sixty in a very dense rosette, the outer ones spreading, an inch and a half to two inches long by six to seven lines broad five-sixths of the way up, the apex subdeltoid with a mucro, the lower three-quarters cuneately narrowed to a broad base, both sides a very pale glaucous-green, the old leaves tinged with red upwards. *Flowering branches* six to nine inches long, slender, terete, pinkish glaucous, with only a few distant bract-like leaves. *Raceme* 8- to 12-flowered, finally two to three inches long. *Bracts* lanceolate, about equalling the erecto-patent *pedicels*, the lowest of which are at last three lines long. *Calyx* and *corolla* of the two preceding.

This and the two preceding are closely allied, and quite agree in general habit, calyx and corolla.—*J. G. B.*

This species is very nearly allied to *C. glauca*, requiring the same treatment, and is a still more useful plant for edgings to borders during the summer months. It has much the same glaucous-green tint as the species just alluded to, but its leaves are longer, narrower, more pointed, and produced in such numbers as to form a very regular compact rosette. This species, with the old *C. secunda* and *C. glauca*, have all the same habit. I received it from Mons. Van Houtte, of Ghent, many years since.—*W. W. S.*

17. *C. STRICTIFLORA* (Baker). Acaulis, glabra, foliis rosulatis, oblanceolato-spathulatis triplo longioribus quam latis, apice acutis, deorsum e basi tertii superioris spathulatim attenuatis, ramorum floriferorum valde reductis, floribus 15—20 in racemum elongatum laxum secundum demum omnino erectum dispositis, pedicellis brevibus erecto-patentibus, sepalis æqualibus lanceolatis ascendentibus corollâ rubrâ duplo brevioribus. — *Echeveria strictiflora*, A. Gray, *Plant. Wright*, i. p. 76.

Gathered by Mr. C. Wright in an expedition from Western Texas to New Mexico, and in the United States' survey of the Mexican boundary under Major W. H. Emory.

Not at all caulescent, glabrous. The *leaves* in a sparse (?) rosette, oblanceolate-spathulate, the largest in dried specimens three inches long by an inch broad two-thirds of the way up, narrowed gradually to an acute point and spathulately downwards to a narrow base. *Flowering branch* a foot and a half to two feet long, its leaves few and bract-like. *Flowers* fifteen to twenty in a second *raceme*, which is finally a foot long and quite erect. The *pedicels* much shorter and stouter than the three preceding. *Calyx* ascending, the divisions lanceolate, equal, about half as long as the red *corolla*, which is five-eighths of an inch long.

Studied upon dried specimens only. Allied to the three preceding, but the leaves quite a different shape, the flowering branch stronger and more rigid and pedicels shorter.

§§§§ Gibbifloræ.

18. *C. BRACTEOLATA* (Baker). Longe caulescens, glabra, foliis sparsis, oblanceolato-spathulatis, triplo longioribus quam latis, apice rotundatis, ægre apiculatis, utrinque pallide nitide viridibus, ramorum floriferorum paucis, valde reductis, floribus in racemis laxis subsecundis 10—12-floris simplicibus vel ad basin furcatis dispositis, bracteis oblanceolatis pedicellis erecto-patentibus longioribus, sepalis linearibus inæqualibus corollâ flavo-rubrâ æquantibus. — *Echeveria bracteolata*, Link, Klotzsch et Otto *Ic. Plant.* ii. t. 68; *Walp. Rep.* ii. p. 259; *Lemaire, Illust. Hort.* vol. x. *Suppl.* p. 78.

Andes of New Granada, introduced in 1840.

Glabrous; the *stems* attaining a height of a foot and a thickness of three-eighths of an inch, bright green, the scars roundish. *Leaves* oblanceolate-spathulate, not rosulate, twenty to thirty, the lower ones decurved, the upper horizontal, the largest two and a

half to three inches long by three-quarters of an inch broad three-quarters of the way up, the apex rounded and faintly apiculate, both sides a bright light shining green, not at all glaucous, the old ones with a faint reddish tinge. *Flowering branch* a foot and a half to two feet long, with a few much-reduced leaves. *Flowers* ten to twelve in lax drooping subsecund *racemes* which are either simple or branched at the base. *Bracts* oblanceolate-spathulate, the lower ones longer than the pedicels. *Pedicels* ascending, the lower ones bracteolate, three-eighths to half an inch long. *Sepals* linear, unequal, the longest about equalling the yellowish red *corolla*, which is decidedly pentagonal, under half an inch long.

19. C. SCHEERII (*Baker*). Caulescens, glabra, foliis rosulatis, magnis, oblongo-spathulatis, triplo longioribus quam latis, acutis, utrinque glauco-viridibus, ramorum floriferorum numerosis, valde reductis, floribus 30—40 in racemis tribus secundis nutantibus dispositis, bracteis oblanceolatis pedicellis erecto-patentibus multo excedentibus, sepalis patulis, linearibus, inæqualibus, corollâ saturate rubro-auriantiacâ brevioribus. — *Echeveria Scheerii*, Lindl. Bot. Reg. 31, t. 27.

Mexico.

Caulescent, glabrous. *Leaves* rosulate, oblongo-spathulate, the largest six to seven inches long by more than two inches broad three-quarters of the way up, the point acute, the lower two-thirds spathulately narrowed, both sides glaucous-green. *Leaves of the flowering branch* numerous, but much reduced. *Flowers* in a trifid *raceme* with secund drooping branches six to eight inches long, with ten to twelve flowers each. *Bracts* half an inch to an inch long, the upper ones imbricated. *Pedicels* erecto-patent, the lowest a quarter of an inch long. *Sepals* linear, spreading, very unequal, a quarter to three-eighths of an inch long. *Corolla* five-eighths to three-fourths of an inch long, red and yellow, decidedly pentagonal.

We have not seen this, and have compiled the description from Lindley's figure and notes.—*J. G. B.*



W. H. Fitch, del et lith

J. N. Fitch, imp.

Cotyledon stolonifera, Baker.

TAB. 63.

20. *C. STOLONIFERA* (Baker). Breviter caulescens, glabra, valde stolonifera, foliis dense rosulatis obovato-spathulatis, duplo longioribus quam latis, apice subdeltoideis mucronatis, utrinque pallide nitide viridibus, ramorum floriferorum paucis, valde reductis, floribus 4—6 in cymum confertum parvum dispositis, bracteis oblanceolatis pedicellis erectis brevibus multo excedentibus, sepalis linearibus inæqualibus corollâ rubro-aurantiâ brevioribus.

Mexico.

Glabrous, shortly caulescent, very copiously stoloniferous. *Leaves* thirty to forty in a dense rosette, obovate-spathulate, the largest two to two and a half inches long by about half as broad five-sixths of the way up, the apex rounded and decidedly apiculate, the lower three-quarters spathulately narrowed to a broad base, both sides a pale bright green with a very slight glaucous tinge, the centre of the blade one-eighth of an inch thick. *Flowering branches* six to eight inches long, with a few oblong-spathulate leaves under an inch long. *Flowers* four to six in a close *cyme*, the *bracts* that subtend the main branches half an inch long. *Ultimate pedicels* a line and a half to two lines long. *Sepals* thick, linear, very unequal, usually shorter than the yellowish-red decidedly pentagonal *corolla*, which is half an inch long.—*J. G. B.*

This species may be treated much in the same manner as the two foregoing during the winter, but I have not tried it out-of-doors during the summer, although I think it would then stand the open air, in dry situations, well. It throws out from near the base numerous shoots or stolons, from whence its name, and by these it may be easily increased. I received it from Mexico, a few years since.—*W. W. S.*



W. H. Fitch, del. et. hth

J. N. Fitch, imp.

Cotyledon fulgens, Baker.

TAB. 64.

21. *C. FULGENS* (Baker). . Caulescens, glabra, foliis rosulatis obovato-spathulatis, ultra duplo longioribus quam latis, apice rotundatis apiculatis, utrinque glauco-viridibus, demum margine ægre crispatis, ramorum floriferorum paucis, valde reductis, floribus 15—20 in paniculam cymosam ramis paucis nutantibus racemosis dispositis, bracteis pedicellis erecto-patentibus multo longioribus, sepalis lanceolatis inæqualibus corollâ saturate rubrâ multo brevioribus. — *Echeveria fulgens*, Lemaire, *Jard. Fleur.* t. 244.

Mexico.

Glabrous. The *stems* attaining a height of four to six inches. The *leaves* eight to twelve in a rosette at the apex, the largest about four inches long by an inch and a half to an inch and three-quarters broad three-quarters of the way up, the apex rounded and slightly pointed, the lower three-quarters spathulately narrowed to a broad base, the centre of the blade one-eighth of an inch thick, both sides a pale glaucous-green, the edge only slightly crisped when old. *Flowering branches* twelve to eighteen inches long, with several ascending lanceolate-spathulate leaves an inch or more long. *Flowers* twelve to twenty in an irregular *panicle*, with nutant racemose branches two to three inches long, the flowers of which do not reach down to the base. Main *bracts* oblanceolate-spathulate, three-quarters of an inch to an inch long. *Pedicels* erecto-patent, three to four lines long. *Sepals* lanceolate, very unequal, spreading or slightly ascending, considerably shorter than the pentagonal *corolla*, which is bright coral-red on the outside, yellow in the throat, half to five-eighths of an inch long.

Very near *C. retusa*, but shortly caulescent; the leaves narrower and more glaucous, hardly at all crisped at the edge; and the cyme not so close.—*J. G. B.*

A beautiful species, producing, when well-grown, many coral-red flowers at the same time, which are of long duration. It requires a warm greenhouse treatment, and should be potted in rich light loam and leaf-mould, the pots well drained. It is freely increased by seeds, cuttings, or by the leaves, inserted in sand. The source from whence my plants were obtained is doubtful.—*W. W. S.*

22. *C. RETUSA* (Baker). *Ægre caulescens, glabra, foliis dense rosulatis, obovato-spathulatis, duplo longioribus quam latis, apice rotundatis, demum retusis, utrinque subglaucoviridibus, demum margine crispatis, ramorum floriferorum paucis, valde reductis, floribus 10—15 in paniculam cymosam ramis paucis racemosis brevibus dispositis, bracteis pedicellis erecto-patentibus multo longioribus, sepalis lanceolatis inæqualibus corollâ saturate rubrâ multo brevioribus.* — *Echeveria retusa*, Lindl. *Bot. Reg.* vol. xxxiii. t. 57; *Part. Fl. Gard.* t. 73; *Walp. Ann.* iii. p. 323.

Mexico.

Glabrous, acaulescent or very shortly caulescent. The *leaves* ten to fifteen in a dense rosette, obovate-spathulate, the largest three inches long by rather over half as broad three-quarters of the way up, the apex rounded, bluntly pointed, finally sometimes retuse, the lower three-quarters spathulately narrowed to a broad base, both sides a pale slightly glaucous-green, the edge of the old leaves much crisped and conspicuously tinged with red. *Flowering branches* six to twelve inches long, with four to six oblong-spathulate leaves, the lowest an inch or more long. *Flowers* ten to fifteen in a small *panicle*, with a few short racemose branches, the lowest horizontal, two to three inches long, with flowers down to the base. Main *bracts* three-quarters to an inch long. *Pedicels* cernuous, a quarter of an inch long. *Sepals* lanceolate, unequal, much shorter than the bright red pentagonal *corolla*, which is half to five-eighths of an inch long.

23. *C. GIBBIFLORA* (Moc. et Sess.) *Longe caulescens, glabra, foliis rosulatis, magnis, obovato-spathulatis, triplo longioribus quam latis, apice subdeltoideis, apiculatis, utrinque pallide glaucoviridibus, demum roseo tinctis, ramorum floriferorum paucis, valde reductis, floribus 30—60 in paniculam thyrsoidem laxam ramis patentibus racemosis sæpe nutantibus dispositis, bracteis lanceolatis, pedicellis erecto-patentibus multo excedentibus, sepalis linearibus patulis inæqualibus, corollâ saturate rubro-aurantiacâ plerisque brevioribus.* — *Echeveria gibbiflora*, D. C. *Prodr.* iii. p. 401; Lindl. *Bot. Reg.* t. 1247. *Echeveria grandifolia*, Haw. *Tayl. Phil. Mag.* 1828; *Sweet. Fl. Gard.* t. 275; *Walp. Rep.* ii. p. 935.

Mexico.

Glabrous. The *stems* a foot to two feet long, an inch to an inch and a half thick, the scars an inch broad by one-eighth of an inch deep. *Leaves* twelve to twenty in a close rosette at the

apex, obovate-spathulate, the largest six or seven inches long by two and a half inches broad five-sixths of the way up, the apex subdeltoid, bluntly pointed, the blade a line and a half to two lines thick in the middle, the base acutely keeled beneath and distinctly channelled above, both sides a pale glaucous-green, tinged with pink when old. *Flowering branch* a foot to two feet long, the leaves few and much reduced. *Flowers* thirty to sixty in a lax *panicle* with racemose branches, the lowest horizontal, sometimes a foot long. *Bracts* oblanceolate-spathulate, an inch to two inches long. Lower *pedicels* a quarter to three-eighths of an inch long, the upper ones shorter. *Sepals* thick, linear, very unequal, spreading, usually shorter than the decidedly pentagonal *corolla*, which is five-eighths of an inch long, bright red on the outside, yellow within and at the base.—J. G. B.





W.H. Fitch, del et lith.

Cotyledon gibbiflora M. & S. var. *metallica*, Baker.

J. N. Fitch, imp.

TAB. 65.

Var. METALLICA (Baker). — *Echeveria metallica*, Lemaire, *Illust. Hort.* vol. x. *Suppl.* p. 81.

General habit and *flowers* as in the type, but the *leaves* broader, the largest seven to seven and a half inches long by five to five and a half inches broad five-sixths of the way up, much rounded towards the apex, with a faint apiculus, not at all concave, when young a decided purplish lilac edged with glaucous-green, passing into a brownish bronzy green as they fade, the edge not at all crisped.

Var. CRISPATA (Baker). — *Echeveria metallica* var. *crispata*, Hort.

Like the last, but the well-developed *leaves* scarcely longer than broad, and the margin considerably crisped.

We are not acquainted with the "*E. Bernhardiana*, Forst. Hort. Germ." mentioned by Lemaire (*Illust. Hort.* vol. x. *Suppl.* p. 78), but suppose, from the short notice, that it may be a variety of this species.—J. G. B.

C. gibbiflora var. *metallica* is a very striking variety, with large leaves of a beautiful purplish metallic hue. When well-grown it is a very handsome plant, well suited for conservatory decoration, and for bedding out in the open air during the summer months. It thrives best in an airy, light, warm greenhouse, grown in well-drained pots filled with light turfy loam and leaf-mould. The plant was introduced from Mexico, some years since, by the late Hugh Cuming (who kindly sent to me his whole stock), then consisting of two stick-like succulent stems of about a foot in length. It is easily increased by seeds, and the leaves, properly treated, will root, but not freely.—W. W. S.



W.C. C. 1904

J. N. S. 1904

Cytisodon praecox, Baker

TAB. 66.

§§§§§ Cæspitosæ.

24. *C. PULVERULENTA* (Baker). Caulescens, glabra, foliis dense rosulatis, oblongo-spathulatis, acutis, triplo vel quadruplo longioribus quam latis, utrinque farinosis, ramorum floriferorum numerosis, parvis, cordatis, floribus in racemis tribus secundis nutantibus multifloris dispositis, bracteis ovatis amplexicaulibus pedicellis subæquantibus, sepalis lanceolatis æqualibus ascendentibus corollâ obscure rubro-aurantiâ duplo brevioribus.—*Echeveria pulverulenta*, Nuttall in Torr. et Gray, *Flora N. Am.* p. 560; Walp. Rep. ii. p. 259.

California.

Glabrous. The *stem* eight to twelve inches long, an inch thick. The *leaves* twenty to thirty in a dense rosette, oblong-spathulate, the largest three to four inches long by an inch broad a little above the middle, the apex subdeltoid-acuminate, the centre of the blade one-eighth of an inch thick, both sides quite white-pulverulent, slightly tinged with pink when fading. *Flowering branches* two to three feet long, with numerous small ascending ovate-amplexicaul leaves. *Flowers*, in the only living example we have seen, in a *panicle* branched from the base, with three drooping racemose branches, the longest a foot long. *Bracts* ovate-amplexicaul, the lowest about equalling the ascending *pedicels*, which are one-fourth to three-eighths of an inch long. *Sepals* lanceolate, three to three and a half lines long, adpressed to the dull reddish-yellow *corolla*, which is five-eighths of an inch long, and scarcely at all pentagonal.—*J. G. B.*

A very remarkable species, having the leaves entirely covered with meal-like powder, which gives them a very white delicate appearance. It should be grown in a dry, warm, light greenhouse, should be carefully watered at all times, and potted in very light turfy loam, peat, sand and a little leaf-mould, well mixed. The plant is of rare occurrence in collections, owing to the difficulty there is of keeping it in a healthy condition. I am indebted to the Royal Gardens at Kew for my plant. I have had it many years under cultivation, during which time it has only flowered once.—*W. W. S.*



W.W.S. del Fitch hth.

J.N. Fitch, imp

Cotyledon agavoides, Baker.

TAB. 67.

25. *C. AGAVOIDES* (Baker). Acaulis, glabra, foliis dense rosulatis, percrassis, ovatis, spinoso-aristatis, utrinque pallide glauco-viridibus papilloso demum paullulum rubro tinctis, ramorum floriferorum subnullis, floribus 4—6 in cymum laxum dispositis, bracteis parvis, pedicellis gracilibus elongatis, sepalis deltoideis ascendentibus æqualibus corollâ aurantiacâ 6-plo brevioribus. — *E. agavoides*, Lemaire, *Ill. Hort.* vol. x., *Suppl.* p. 78.

Mexico.

Glabrous, not at all caulescent. The *leaves* fifteen to twenty in a dense rosette, ovate, an inch and a half to two inches long by an inch broad half-way up, narrowed above to a rigid spiny point, the centre of the blade three-eighths of an inch thick, the upper surface slightly concave, the back much rounded, both sides a very pale glaucous-green, and distinctly reticulated with papillæ, the old ones faintly tinged with red at the edge. *Flowering branch* eight to twelve inches long, slender, with only a very few small bract-like leaves. *Flowers* four to six in a sparse *cyme*. The *bracts* linear, very minute. The *pedicels* half to three-fourths of an inch long. *Calyx* under one-eighth of an inch deep, the lobes deltoid, equal, ascending. *Corolla* orange, half to five-eighths of an inch deep, scarcely at all pentagonal.

A very distinct species.—*J. G. B.*

This is another species hitherto rare in collections, and difficult of increase except by seeds. The plant requires much the same treatment as the last, and greatly resembles an Aloe of the section *Haworthia*, notwithstanding that it has been likened to an Agave, whence its name. I have raised the plant from Northern Mexican seeds, presented to me by H. Moberly, Esq. I am also indebted to the Royal Gardens at Kew for a plant of this interesting species.—*W. W. S.*





W.W. S. del. Fitch, hth

J. N. Fitch, imp.

Cotyledon cymosa, Baker.

TAB. 68.

26. *C. CYMOSA* (Baker). Acaulis, glabra, foliis rosulatis oblongo-lanceolatis, triplo longioribus quam latis, ex apice tertii inferioris ad apicem acutum sensim attenuatis, utrinque pallide glauco-viridibus, ramorum floriferorum paucis, valde reductis, floribus 20—30 in cymum ramis erecto-patentibus dispositis, bracteis lanceolatis, superioribus pedicellis longis gracilibus erecto-patentibus æquantibus, sepalis lanceolatis æqualibus ascendentibus corollâ flavâ triplo brevioribus.—*Echeveria cymosa*, "Hort. Angl."; Lemaire, *Illust. Hort.* vol. x. *Suppl.* p. 79.

Mexico.

Glabrous, not at all or very shortly caulescent. The *leaves* twenty to thirty in a dense rosette, oblong-lanceolate, the largest four inches or more long by an inch broad a third of the way up, narrowed downwards to a broad base, and gradually upwards to an acute point, not more than a line thick in the centre, both sides a pale glaucous-green, faintly tinged with red when old. *Flowering branch* a foot or more long, with a few much-reduced leaves. *Flowers* twenty to thirty in a dichotomously-forked *cyme* with erecto-patent branches. *Bracts* lanceolate, three-eighths to three-fourths of an inch long. Ultimate *pedicels* erecto-patent, three to four lines long. *Calyx* under a quarter of an inch deep, the divisions equal, lanceolate, ascending. *Corolla* yellow, five-eighths of an inch deep, hardly at all pentagonal.—*J. G. B.*

A dwarf species, of slow growth, requiring careful watering to keep it in health, to receive which the plant must be potted in light sandy loam and leaf-mould, and kept in small pots, placed near the light in a warm greenhouse. It may be increased by seeds. I obtained my plants in 1855, from the collection of Mons. L. Van Houtte at Ghent.—*W. W. S.*



W.H. Fitch, del. et lith.

J.N. Fitch, imp.

Cotyledon cœspitosa, Haworth.

TAB. 69.

27. *C. CÆSPITOSA* (Haworth, *Misc.* p. 180). Acaulis, glabra, foliis dense rosulatis, ligulato-lanceolatis, triplo vel quadruplo longioribus quam latis, acutis, utrinque glauco-viridibus, ramorum floriferorum numerosis, valde reductis, ovato-amplexicaulibus, floribus 20—40 in cymum copiose ramosum ramis scorpioideis dispositis, bracteis ovatis pedicellis æquantibus, sepalis lanceolatis æqualibus ascendentibus corollâ stramineâ plus duplo brevioribus. — *Sedum Cotyledon*, Jacq. *Eclog.* i. t. 17. *Echeveria cæspitosa*, D. C. *Prodr.* iii. p. 401. *C. linguiformis*, Ait. *Hort. Kew*, edit. 2, vol. iii. p. 109. *C. reflexa*, Willd. *Enum. Suppl.* p. 24.

Mexico and California.

Glabrous, not at all caulescent. The leaves twenty to thirty in a dense rosette, ligulate-lanceolate, the largest two and a half to three inches long by three-quarters of an inch broad two-thirds of the way up, narrowed very slightly downwards, gradually upwards to an acute point, the centre of the blade one-eighth of an inch thick, both sides glaucous-green, faintly tinged with red when fading. Flowering branch a foot or more long, with numerous ovate-amplexicaul spreading much-reduced leaves. Flowers twenty to thirty in a copiously-compound cyme with scorpioid branches, the lower ones horizontal. Bracts minute, the lower ones equaling the pedicels, which are two to three lines long. Sepals lanceolate, ascending, equal, two to two and a half lines long. Corolla pale straw-yellow, four and a half to five lines long, hardly at all pentagonal.

So far as we can judge from the descriptions, *E. laxa*, Lindl. *Journ. Hort. Soc.* iv. p. 292, *E. campanulata*, Kunze, *Delect. Sem. Hort. Lips.* adn. p. 7, and *E. lanceolata*, Nuttall in Torrey & Gray's *Flora N. Am.* p. 561, do not differ from this materially.—J. G. B.

This plant I find very impatient of moisture at the roots during the winter season, and requires great care in its cultivation. It should be grown in small pots, and treated much in the same way as the last. I obtained the plant in 1855, at the nursery of Mons. L. Van Houtte at Ghent: it was reared from seeds received from California.—W. W. S.



W. B. Fernald, 1916

J. N. Rose, 1916

Corydalis californica, Fisher

TAB. 70.

28. *C. CALIFORNICA* (Baker). Acaulis, glabra, foliis dense rosulatis, ligulato-lanceolatis, triplo longioribus quam latis, acutis, utrinque glauco-farinosi, ramorum floriferorum numerosis, valde reductis, ovato-amplexicaulibus, floribus 12—20 in cymum ramis geminatis vel tribus racemosis dispositis, bracteis ovatis pedicellis subpatentibus æquantibus, sepalis lanceolato-deltoidis æqualibus corollâ stramineâ triplo brevioribus.—*Echeveria californica*, Hort.

California.

Not caulescent or very slightly so. The leaves twenty to thirty in a dense rosette, ligulate-lanceolate, the largest two to two and a half inches long by three-fourths to seven-eighths of an inch broad three-quarters of the way up, narrowed from this to an acute point and downwards to a broad base, the blade one-eighth of an inch thick in the middle, both sides very glaucous, still so when old, with a very faint reddish tinge. Flowering branch a foot long, the stem glaucous and deeply tinged with red, the leaves numerous, ovate-amplexicaul, under an inch long. Flowers twelve to twenty in a bifid or trifid raceme, the bracts thick, ovate, one-fourth to three-eighths of an inch long, the pedicels spreading, short, thick, two to three lines long. Corolla two to two and a half lines long, the divisions lanceolate-deltoid, equal, adpressed to the pale straw-yellow corolla, which is five-eighths of an inch deep, the divisions hardly at all pentagonal.

Midway between *cæspitosa* and *farinosa*.—J. G. B.

A very pretty dwarf species, easily increased by offsets and seeds. It is not difficult of cultivation, grown in small well-drained pots, filled with sandy loam and peat, in an ordinary greenhouse. This is another species I obtained from M. L. Van Houtte, of Ghent, in 1855, who gives California as its native country.—W. W. S.



W. H. Fitch, del et lith.

J. N. Fitch, imp.

Cotyledon farinosa, Baker

TAB. 71.

29. *C. FARINOSA* (Baker). Glabra, breviter vel ægre caulescens, foliis dense rosulatis, modice crassis ligulato-lanceolatis, quadruplo longioribus quam latis, acutis, basi dilatatis, utrinque primum omnino farinosis, demum glauco-viridibus, ramorum floriferorum numerosis, parvis, ovato-amplexicaulibus, floribus 20—30 in cymum copiose ramosum ramis scorpioideis patentibus dispositis, bracteis ovatis, parvis, pedicellis crassis, brevibus, erecto-patentibus, sepalis lanceolatis, æqualibus, ascendentibus, corollâ flavâ ultra duplo brevioribus. — *Echeveria farinosa*, Lindl. Journ. Hort. Soc. iv. p. 292; Walp. Ann. ii. p. 669.

California.

Glabrous, slightly rosulate. The *leaves* twenty to thirty in a dense rosette, ligulate-lanceolate, the longest two and a half to three inches long by five-eighths to three-quarters of an inch broad half-way up, hardly narrowed downwards, the base dilated, narrowed upwards to an acute point, the centre two lines thick, not at all concave on the face, both sides quite white-farinose when young, fading to a decidedly glaucous-green with a very faint reddish tinge. *Flowering branch* a foot high, stout, with numerous cordate-amplexicaul leaves under an inch long. *Flowers* twenty to thirty in a *cyme*, with scorpioid spreading main branches, the thick cordate-amplexicaul *bracts* two to three lines long. *Pedicels* thick, ascending, not more than one-eighth of an inch long. *Sepals* a quarter of an inch long, broad-lanceolate, equal, ascending. *Corolla* yellow, half to five-eighths of an inch long, scarcely at all pentagonal.

This and the three preceding nearly coincide in calyx and corolla.—*J. G. B.*

A delicate and beautiful species, the leaves of which are densely covered, when in good condition, with a white meal-like powder. It is most impatient of water, either at the roots or on the leaves, and requires much attention to keep it in health. I find it does well, grown in small well-drained pots, in a mixture of turfy loam, peat, sand and leaf-mould, and kept in a dry, airy, light greenhouse. It can be increased by cuttings and seeds. My plant came from the collection of Mons. L. V. Houtte at Ghent, in 1855, and was stated to be from California.—*W. W. S.*

Imperfectly-known Species.

30. *C. SUBSPICATA* (Baker).

Columbia ; rocks near the snow-line, Chevada de Santa Marta, gathered by the late Mr. Purdie.

Caulescent, glabrous. The *leaves* densely rosulate, oblong, slightly spatulate, acute, the largest in a dried specimen two inches long by an inch broad. *Flowering branch* erect, about a foot high. *Flowers* thirty to forty in a dense equilateral *raceme*, the upper ones subsessile, the lower spreading or slightly cernuous. *Calyx-teeth* ascending, lanceolate, a quarter of an inch long. *Corolla* red, pentagonal, half an inch long.

Near *C. coccinea*, but glabrous, and the flowers slightly stalked.

31. *C. SPRUCEI* (Baker).

Andes of Ecuador, *Spruce*, 5463.

Caulescent, glabrous, densely rosulate. The *leaves* lanceolate, not at all spatulate, narrowed gradually from below the middle to an acute point, the largest in a dried specimen half an inch long by half as broad. The *flowering branch* erect, upwards of a foot long. The *flowers* ten to twelve in a lax equilateral *raceme* about half as long. The patent cernuous *pedicels* three-eighths of an inch long. The *calyx* a quarter of an inch deep, with linear reflexed divisions. The *corolla* red, half an inch long, decidedly pentagonal.

32. *C. SUBULIFOLIA* (Baker). — *Echeveria teretifolia*, *D.C. Prodr.* iii. p. 401 ; *D.C. Crass.* t. 6.

Mexico.

Leaves of flowering branch numerous, ascending, quite terete, an inch or more long. *Flowers* in geminate secund *spikes* three to four inches long, of six to eight flowers each. *Bracts* like the leaves, but three to four lines long. *Calyx* sessile, with thick linear unequal divisions, not more than half as long as the reddish yellow pentagonal *corolla*, which is under half an inch long.

Apparently a very distinct plant. There is already a Cape *C. teretifolia*, Thunb.

33. *C. GRAYII* (Baker). Foliis radicalibus obovato-lingulatis, caulinis sparsis parvulis lanceolatis canaliculatis, omnibus mucronato-acutis, floribus laxè paniculatis, undequaque versis, petalis apice breviter recurvis sepalis duplo superantibus. — *Echeveria paniculata*, A. Gray, *Pl. Wright*, p. 76.

New Mexico, *Wislizenus*.

Flowering stems a foot long, above the rosulate and apparently radical tuft of *leaves*, the latter two to three inches long, the scattered or subopposite stem-leaves from half an inch to an inch long. *Flowers* half an inch long, disposed in a loose elongated *panicle*; the proper terminal flowers are on very short *peduncles*, the lateral ones mostly with long bracteate peduncles. *Bracts* small, linear.

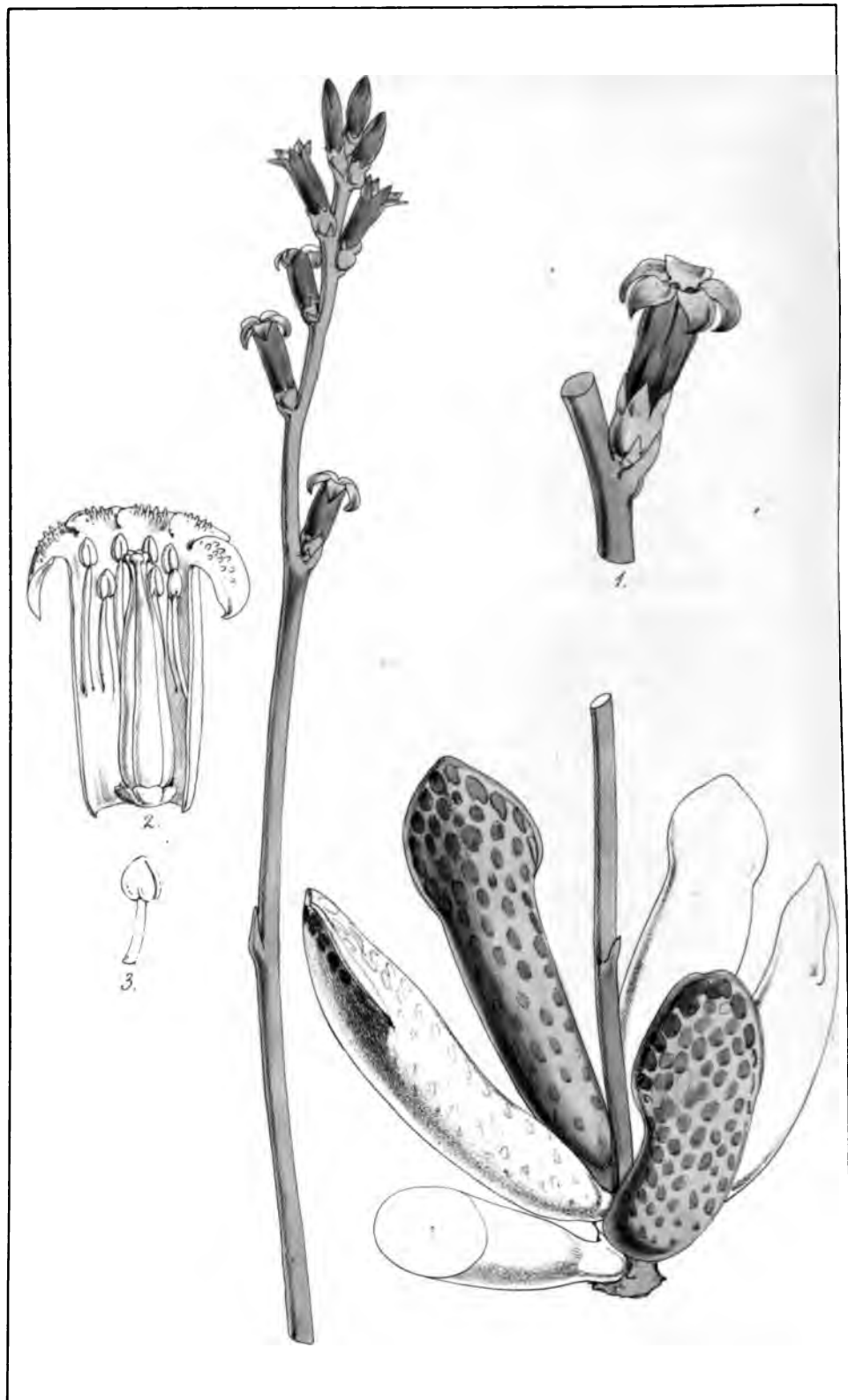
34. *C. ACUTIFOLIA* (Baker).—*Echeveria acutifolia*, Lindl. *Bot. Reg.* 28, t. 29; *Walp. Rep.* ii. p. 259.

Mexico.

General habit, *calyx* and *corolla* of *C. gibbiflora*, but the *leaves* more concave and more acute, and *flowers* in a narrow congested *panicle*, with the lower *branches* only 3- to 4-flowered.

Very likely a form of *gibbiflora*. A plant which approaches it closely was found by Salvin and Godman in Guatemala.

There are several other species in the collection of Mr. Saunders, which have not flowered yet, of which we hope to be able to give an account in future Numbers.—*J. G. B.*



W. H. Fitch, del et lith.

J. N. Fitch imp.

Cotyledon Cooperi, Baker.

TAB. 72.

C. COOPERI (*Baker*). *Ægre* caulescens, glabra, foliis aggregatis, triplo longioribus quam latis dimidio inferiore teretibus, quarto superiore cite spathulatim dilatatis, utrinque pallide glauco-viridibus, maculis saturatioribus et purpureis, scapis erectis subnudis, floribus 6—10, laxè spicatis, calycis dentibus tubum campanulatum æquantibus, calyce corollâ tubulosâ rubrâ segmentis lanceolato-deltoidæis demum reflexis quadruplo brevior.

Cape of Good Hope, imported by Mr. Cooper.

Glabrous, scarcely at all caulescent. The *leaves* five to six aggregated near the base, oblanceolate-spathulate, two inches long by five-eighths to three-fourths of an inch broad three-quarters of the way up, the lower half nearly as thick as broad, the exterior quarter suddenly spathulately dilated laterally, narrowed to the apex horizontally, both sides a pale glaucous-green with spots of darker green, and towards the edge also of purple. *Scape* about a foot high including the spike, the lower three-quarters nearly naked. *Flowers* six to ten in a lax *spike*, quite sessile, the *bracts* thick, lanceolate, shorter than the *calyx*, which is one-eighth of an inch deep, with deltoid teeth equalling the campanulate tube. *Corolla* red, tubular, five-eighths of an inch deep, the lanceolate-deltoid divisions not reaching a quarter of the way down.—*J. G. B.*

A small and remarkable species, but little known. It grows slowly, and should be kept in a warm, dry, light greenhouse, potted in sandy loam and leaf-mould, with good drainage and little pot-room. I received it from South Africa, where it was discovered on the Zuurberg Range, by Mr. Thos. Cooper, in 1860.—*W. W. S.*

Analytical Table of the American species of Cotyledon
(*Echeveria*, D. C.)

§ SPICATÆ.—Flowers in spikes.

Caulescent.

Leaves and the whole plant pubescent.

Leaves obovate-spathulate 1. *pubescens*.

Leaves oblanceolate-spathulate 2. *coccinea*.

Leaves and whole plant glabrous 3. *roseata*.

Not caulescent 4. *mucronata*.

§§ RACEMOSÆ.—Flowers in equilateral racemes.

Caulescent.

Leaves not densely rosulate.

Blade $\frac{1}{4}$ —2 lines thick.

Flowers 4—8; leaves four times as long as broad. 5. *quitensis*.

Flowers 10—15; leaves twice as long as broad. 7. *nuda*.

Blade half an inch thick 8. *linguæfolia*.

Leaves densely rosulate.

Pedicels erecto-patent.

Flowers 4—6 in a lax short raceme 6. *nodulosa*.

Flowers 12—20 in a lax long raceme 9. *canaliculata*.

Flowers 30—40 in a dense raceme 30. *subspicata*.

Pedicels long, spreading 31. *Sprucei*.

Not caulescent.

Leaves twice as long as broad. 10. *peruviana*.

Leaves 3—4 times as long as broad. 11. *lurida*.

§§§ SECUNDÆ.—Flowers in secund racemes.

Caulescent; leaves not rosulate.

Sepals valvate, oblong-spathulate, exceeding the corolla.

12. *Pachyphytum*.

Sepals lanceolate, much shorter than the corolla. 13. *adunca*.

Sepals thick, linear, unequal, the longest about equalling the corolla.

18. *bracteolata*.

Caulescent; leaves densely rosulate.

Lower pedicels 3—4 lines long.

Leaves hardly at all glaucous 14. *secunda*.

Leaves very glaucous.

Leaves obovate-cuneate 15. *glauc*.

Leaves oblanceolate-cuneate 16. *pumila*.

Lower pedicels $1\frac{1}{4}$ —2 lines long 17. *strictiflora*.

§§§§ GIBBIFLORE.—Inflorescence compound. Sepals linear, unequal.
Corolla red, decidedly pentagonal.

Flowers in bifid or trifid racemes.

Leaves terete 32. *subulifolius*.

Leaves flat, spatulate.

Leaves of main stem scattered, 2½—3 inches long. 18. *bracteolata*.

Leaves of main stem rosulate, 6—7 inches long . 19. *Scheerii*.

Flowers in short cymose panicles.

Flowers 4—6; leaves 30—40 in a rosette . . . 20. *stolonifera*.

Flowers 10—20; leaves 8—15 in a rosette.

Leaves slightly crisped at the edge when old . 21. *fulgens*.

Leaves much crisped at the edge when old . . 22. *retusa*.

Flowers in elongated narrow panicles.

Leaves obovate-lingulate, 2—3 inches long . . 33. *Grayi*.

Leaves obovate-spatulate, 4—5 inches long . 34. *acutifolia*.

Flowers in a lax thyrsoïd panicle, with long horizontal lower branches.

23. *gibbiflora*.

§§§§§ CÆSPITOSÆ.—Inflorescence compound. Sepals lanceolate or deltoid,
equal, ascending, 2—6 times shorter than the corolla, which is
scarcely at all pentagonal and usually pale yellow.

Flowers in long bifid or trifid racemes . . . 24. *pulverulenta*.

Flowers in cymes.

Cymes 4—6 flowered; leaves very thick, spine pointed.

25. *agavoides*.

Cymes 20—40 flowered; leaves 1½—2 lines thick, not aristate.

Stem-leaves few, lanceolate; branches of cyme erecto-patent.

26. *cymosa*.

Stem-leaves many, small, cordate-amplexicaul; branches of cyme
scorpioid.

Leaves pale glaucous-green 27. *cæspitosa*.

Leaves glauco-farinose 28. *californica*.

Leaves quite white, with pulverulent mealiness. 29. *farinosa*.

—J. G. B.

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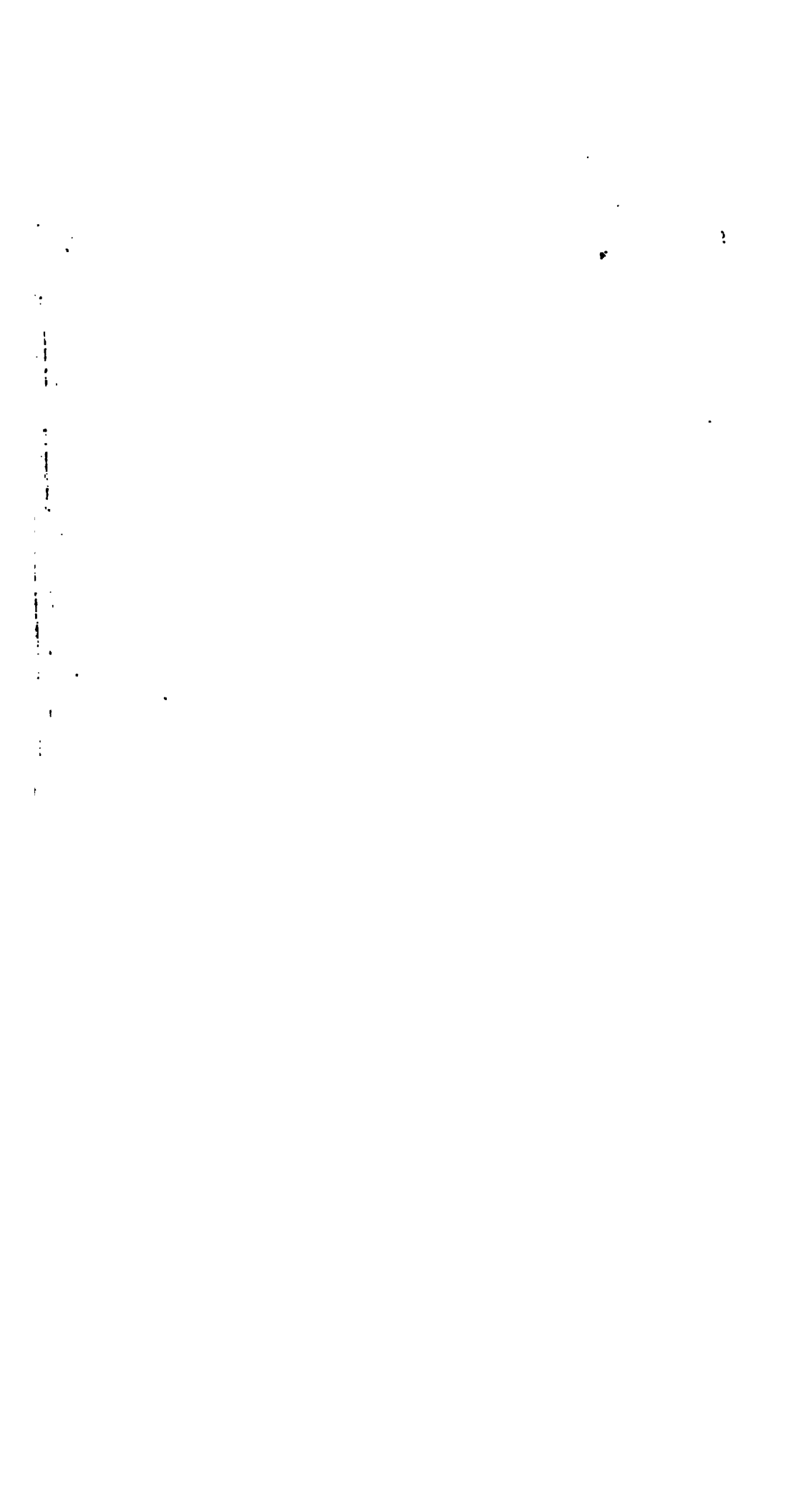
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